

THE MEDICAL JOURNAL OF AUSTRALIA



VOL. I.—16TH YEAR.

SYDNEY, SATURDAY, FEBRUARY 23, 1929.

No. 8.

The 'Allenburys' DIABETIC FLOUR

A reliable and convenient basis for a
carbohydrate-free dietary.

The "Allenburys" Diabetic Flour consists of milk proteins, chiefly casein and lactalbumen, to which leavening agents are added. Bread, biscuits, cakes, omelettes and other foods of a composition suitable for diabetic patients can readily be prepared from this Flour. These foods may be made free from carbohydrates and containing a minimum of fat; or definite proportions of these may be added as tolerance for them increases.

The variety of suitable and palatable foods that can be prepared from this flour, and the fact that they can be made fresh daily in the home, are advantages that are appreciated by patients. Recipes and directions for use are enclosed with each packet. Sent out in boxes of 6 and 12 packets each of 2 ounces.

Composition:

	Per Cent.
Total Proteins	87.0
Fat	0.7
Acid Potassium Tartrate	1.6
Sodium Bicarbonate	1.6
Moisture	9.1
Carbohydrates	nil
Calorific value: 303 calories per 100 grammes or 1,376 calories per lb.	

Descriptive Booklet Sent to Physicians on Request.

Note.—The Premier British Insulin is "AB" Brand. May we send you particulars?

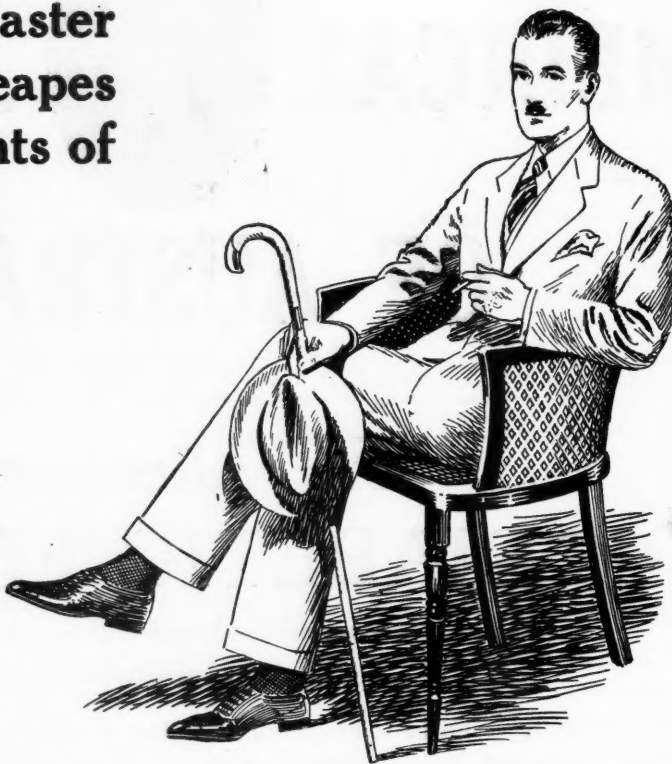
ALLEN & HANBURY'S (AUSTRALASIA) LTD

31 MARKET STREET, SYDNEY, N.S.W.

An early Easter brings to Peapes early shipments of Autumn Suitings

The early advent of Easter this year has induced Peapes to display already, many new and exclusive suitings for cooler weather. They are in unusual and exclusive weaves showing many well-blended tones in the colours to be most favoured by men this year—Blues, Browns, Greys, and Fawns.

An interesting London fashion note is evidenced in the mingling of colours to achieve these harmonious tones. Most weaves show subtle touches of contrasting colours which gain the desired effect without being obtrusive.



Many of the new materials at Peapes' are in individual suit lengths, while the remainder may be selected without the thought of duplication.

Patterns will be forwarded promptly on request.

Prices from eleven guineas.

PEAPES

— for men AND their sons

GEORGE STREET

OPP. HUNTER STREET

SYDNEY

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—16TH YEAR.

SYDNEY, SATURDAY, FEBRUARY 23, 1929.

No. 8.

Authors of articles submitted for publication are requested to read the following instructions and to comply with them.

All articles must be typed with double or treble spacing. Carbon copies should not be sent. Abbreviations should be avoided, especially those of a technical character at times employed in ward notes. Words and sentences should not be underlined or typed in capitals. The selection of the correct type is undertaken by the Editors. When illustrations are required, good photographic prints on glossy gaslight papers should be submitted. Each print should be enclosed in a sheet of paper. On this sheet of paper the number of the figure and

the legend to appear below the print should be typed or legibly written. On no account should any mark be made on the back of the photographic print. If no good print is available, negatives may be submitted. Line drawings, graphs, charts and the like should be drawn on thick, white paper in India ink by a person accustomed to draw for reproduction. The drawings should be large and boldly executed and all figures, lettering and symbols should be of sufficient strength and size to remain clear after reduction. Skiagrams can be reproduced satisfactorily only if good prints or negatives are available. The reproduction of all illustrations but especially of skiagrams entails the sacrifice of

time and energy and is expensive. Authors are expected to take a corresponding amount of trouble on the preparation of their illustrations, whether skiagrams, photographs, wash drawings or line drawings. The references to articles and books quoted must be accurate and should be compiled according to the following scheme. The order should correspond to the order of appearance in the article. The initials and surnames of the authors, the full title of the article or book, the full (unabbreviated) title of the journal in which the article appears, the date of the issue (day, month and year) and the number of the first page should be given in this sequence.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—

	PAGE.
"Oral Sepsis and General Health: Clinical Aspect," by FRANK C. WILKINSON, M.D., B.D.S.	230
"Dental Sepsis and General Disease: Pathological Aspect," by P. MACCALLUM, M.C., M.Sc., M.A., M.B., Ch.B., D.P.H.	232
"Some Bacteriological Aspects of Apical Infection in Its Relation to General Disease," by C. H. KELLAWAY, M.C., M.D., M.S., M.R.C.P.	234
"Some Aspects of Deep X Ray Therapy and Malignant Disease," by H. A. MCCOY, M.B., Ch.M., D.M.R.E.	238
"Some Notes on the Practice of Medicine in Melanesia," by W. L. CALOV, M.B., Ch.M.	241
"The Work of a Psychiatric Clinic in a General Hospital," by H. C. McDONALL, M.B.	244
"Some Surgical Devices," by J. FORBES MACKENZIE, M.B., Ch.B.	246

REVIEWS—

Cardiac Disorders	247
Physiology of the Thyreoid and Adrenals	248
Hæmatology	248

LEADING ARTICLES—

The Ætiology of Malignant Disease	249
---------------------------------------------	-----

CURRENT COMMENT—

Immunity to Pneumococci	250
The Treatment of Hay Fever	251

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—

Dermatology	252
Urology	252

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific	254
Nominations and Elections	258

MEDICAL SOCIETIES—

The Medical Sciences Club of South Australia	258
--------------------------------------------------------	-----

OBITUARY—

Norman John Dunlop	258
Robert Thomson Paton	261
James William Garnett Powell	261

CORRESPONDENCE—

National Insurance Nationalization and the British Medical Association	261
A Warning	261

THE COLLEGE OF SURGEONS OF AUSTRALASIA 261

A CORRECTION 262

LISTS OF MEMBERS 262

DIARY FOR THE MONTH 262

MEDICAL APPOINTMENTS 262

MEDICAL APPOINTMENTS VACANT, ETC. 262

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 262

EDITORIAL NOTICES 262

ORAL SEPSIS AND GENERAL HEALTH: CLINICAL ASPECT.¹

By FRANK C. WILKINSON, M.D., B.D.S.,
*Dean of the Faculty of Dental Science, Professor of
Dentistry, University of Melbourne.*

THE importance of oral sepsis as a source of focal infection, though now widely realized, has been appreciated only quite recently and we are still far from understanding its true significance.

Tonight it is proposed to discuss the problem from three points of view. It is my privilege to place before you certain aspects from the clinical viewpoint.

Up to 1900 little importance was attached to oral sepsis as a factor in the maintenance of general health, the relationship being limited to the recognition that a functional masticatory machine was essential to enable the physiological function of digestion to be performed. But in 1900 Hunter called attention to the part played by oral sepsis as an aetiological factor in the production of various types of blood diseases. His observations were made as the result of clinical experiments which, summed up in a few words, meant that he appreciated a general improvement in the patient's condition subsequent to the removal of the diseased teeth.

These clinical experiments led to an extensive study of the effects of chronic infective processes not only in the mouth but elsewhere on the organism as a whole now termed focal infection. It is not my intention to attempt an explanation of the rationale of focal infection or by a recitation of a number of cases to bring forward further evidence supporting the fact that chronic infective processes can in the course of time and under certain conditions produce secondary inflammatory reactions in remote parts of the body or effect a general upset in the physiological processes of the body as a whole, but briefly to consider the relative importance of the different types of chronic inflammatory reactions so frequently found in the mouth, their diagnosis and treatment.

The chief site of septic processes in the mouth is the periodontal membrane, that is the tissue of tooth attachment. Two quite different types are found: (i) Chronic inflammation arising in the gingivæ, ultimately leading to the involvement of the contiguous tissue, the periodontal membrane and the production of pyorrhœa; (ii) infective areas found at the apices of the teeth following the death and subsequent infection of the pulp.

Both conditions are extremely common. An examination of one hundred consecutive patients between the ages of twenty and forty years attending a dental hospital who were in apparently good health, revealed the fact that on an average they possessed two pulpless teeth per patient. Further, an X ray examination indicated that 50% of these

teeth possessed radiolucent areas. The incidence would be much higher in an audience such as this. Chronic inflammatory reactions in the gingivæ are equally common. The free margin of gum around the teeth is a delicate tissue and readily succumbs to local trauma; it also responds very definitely to general ill health. A subacute gingivitis nearly always accompanies such acute diseases as scarlet fever, measles, typhoid fever and others; a similar condition is found in chronic general toxæmias. In fact it is the opinion of many investigators that the inflammatory processes seen in this tissue, which ultimately involve the periodontal membrane and can then be designated as pyorrhœa, are but an expression of some general disease, modified only by local conditions. If that is so and there is a good deal of experimental and clinical evidence to support it, then it is futile to attempt to cure pyorrhœa by local medication alone. To do so is to treat a symptom and not the cause. The ætiology of pyorrhœa is not completely understood, but animal experiments suggest that faulty metabolism plays an important part. Monkeys fed on certain deficient or unbalanced diets manifest widespread tissue change throughout the body. The oral cavity also shares in the general lowering of resistance to infection; the normal bacterial inhabitants of the mouth, innocuous in health, are now able to invade the tissue and produce an inflammatory reaction comparable in every way to pyorrhœa. It would be absurd in such cases to imagine that the removal of the monkey's teeth would improve its general health, but on the other hand, put the monkey on a full diet and place it in good hygienic surroundings and its health will rapidly improve, the gum tissue along with the body tissue generally will show an increased resistance to bacteria and will be able to resist the low grade infecting organisms in the mouth; a natural cure will take place. The importance of considering all the ætiological factors before throwing the onus upon pyorrhœa as a source of focal infection cannot be emphasized too strongly. Failure to do so has been the cause of many people losing their teeth and the hoped-for improvement in general health not materializing. Support is given to the conception that the inflammatory reaction so prevalent in the free margin of the gum surrounding the teeth is the result of a patient's ill health rather than the cause of it, by the natural improvement in the mouth condition that accompanies an improvement in the general health of the patient. Figure III shows natural arrest in an advanced case of pyorrhœa.

Personally I consider the oral tissues, especially the gingival tissue, to be a very delicate index of a patient's general condition. As a site of focal infection I believe its importance has been overestimated, in its later stages it may be considered as a link in a vicious cycle of general infection, but it is unlikely that it is often the primary cause.

The second type of septic process, that arising around the apex of a tooth with a necrotic pulp, is a purely local phenomenon, though, of course, the immediate inflammatory reaction and the possible

¹Read at a combined meeting of the State Dental Society of Victoria and the Victorian Branch of the British Medical Association on September 25, 1928. By arrangement this article appears simultaneously in the *Australian Journal of Dentistry* and *THE MEDICAL JOURNAL OF AUSTRALIA*.

deleterious action on the body generally will be governed by the general health and resistance to infection.

In 99% of cases the cause of the death of the pulp is caries. As the tooth decays, there comes a time when the delicate tooth pulp can no longer cope with the bacteria that are now able to invade it from the mouth, and it succumbs. The dead pulp is an ideal culture media and it is possible that the optimum conditions of growth may raise the virulence of the organisms invading it from the mouth. If left undisturbed, the necrotic tissue is disintegrated by the action of enzymes commonly present in pathological exudates or by the action of the bacteria present. In either case the degradation products are likely to be toxic to the contiguous vital tissue. An inflammatory reaction occurs, acute or chronic (see Figure IV) according to the intensity of the toxicity and the defensive forces of the individual. If acute, an acute alveolar abscess results, with the production of pus which seeks an outlet in the line of least resistance; the surrounding bone is penetrated, resulting in greater or smaller areas of necrosis. If the toxicity of the products is low or the carious process has proceeded to the extent of bringing the pulp cavity into free communication with the mouth and so allowing the gangrenous products to escape into the mouth, the resulting conditions of pulp gangrene will generally take on a more chronic course. It frequently happens that the patient is not even aware of any such trouble going on in his mouth, as it generally proceeds without any subjective symptoms, such as pain, even on biting. Such a condition if left untreated may be maintained for a long time.

The local symptoms accompanying apical infection are in the main extremely vague and may be absent altogether, the patient being quite unconscious of the tooth. Occasionally there may be

periods of a more acute reaction, when the signs of periodontitis in a greater or less degree will be present. This generally occurs at times when the patient's general resistance has been lowered by some other infection, such as a common cold.

Owing to the indefinite symptoms the diagnosis is frequently overlooked. The following signs may be noted. Since the pulp is dead, if the crown still remains, the tooth will show a loss of translucency and colour changes, varying in intensity to dark grey. There will be no response to thermal or

electrical stimuli. Palpating the buccal gum over the apex, may reveal a bony thickening of the alveolus; at other times the alveolar wall may be felt to be thinned or deficient. In such cases an impulse can be felt by the finger over the apex on percussing the crown of the tooth. But in many cases no abnormality of the alveolar bone can be detected. Where the condition commenced as an acute alveolar abscess, there is generally evidence of the old sinus, the orifice of which is found in or covered by a small raised nodule of fibrous tissue and frequently a bead of pus can be expressed.

The gum over the apical area may be infected and there is a loss of the normal health line, that is the thin line to be seen around the mouth where the gum is reflected on to the cheek, where the

shell pink of the gum meets the deeper red of the mucous membrane of the cheek. A great aid in diagnosis is an X ray photograph, because an inflammatory reaction in bone is frequently accompanied by its absorption or the removal of calcium salts, hence if the condition has proceeded far enough, a shadow will be thrown on the film.

The local reaction varies within wide limits, but there is no unanimity in associating such local reaction, as assessed by our clinical examination and the X ray findings as a definite indication of focal infection. An infective process at the apex

LEGENDS TO ILLUSTRATIONS OF THE ARTICLE BY
DR. FRANK C. WILKINSON.

FIGURE I.

Skiagram; no bony changes are visible at the apex of the canine tooth.

FIGURE II.

Section of the canine tooth seen in Figure I. An active inflammatory reaction with pus formation is seen.

FIGURE III.

Skiagram; there are no bony changes at the apex of the canine tooth.

FIGURE IV.

Section of canine tooth seen in Figure III. Abscess cavity with pus discharging into the nasal cavity is seen.

FIGURE V.

Skiagram; bony absorption is present at the apex of the lateral incisor tooth. The pulp has died under a filling. When the tooth was opened, pus was discharged from the canal.

FIGURE VI.

Skiagram taken four years after treatment had been applied. There are indications of regeneration of bone.

FIGURE VII.

Skiagram revealing a large area of absorption at the apex of the lateral incisor tooth. The pulp of the lateral and central incisors had died as the result of a blow. An acute abscess was present.

FIGURE VIII.

Skiagram taken nine months after treatment had been instituted. There are indications of regeneration of bone.

FIGURE IX.

Skiagram; no bony change is visible at the apex of the canine tooth.

FIGURE X.

Section of the canine tooth seen in Figure IX. A small area of cellular infiltration is visible.

FIGURE XI.

Skiagram; no bony change is seen at the apex of the canine tooth.

FIGURE XII.

Section of the canine tooth seen in Figure XI. The picture shows but little deviation from the normal.

of a tooth, producing very little local reaction, may be responsible for serious general infection. On the other hand we see patients in whom the local result is extensive and there is no detectable sign of general infection.

The pathological and patho-histological picture associated with such observations is more or less assumed, based upon associations we know exist in other parts of the body, but even then we have not a very full knowledge upon which to base our assumptions, for much remains to be explained regarding bone pathology.

I have recently endeavoured to correlate X ray findings with the actual reaction producing them, by examining radiographically the jaws of dogs in which infective areas had been produced experimentally and of which sections were subsequently obtained.

A careful study of Figures V and VI and other pictures I have made of similar cases indicates that skiagrams depict only gross changes and that the shadow thrown does not provide us with any definite indication as to the cause of the change or type of reaction producing it.

But even if our diagnostic methods be so improved as to give us a definite picture of the changes taking place at the apex of a pulpless tooth, we would still be far from the solution of the problem with which we are so frequently faced, whether a pulpless tooth with a radiolucent area at its apex is a menace to a particular individual or not.

If the patient is in good health, it is obvious that whatever a skiagram shows is going on locally, the body generally is not being infected. If, on the other hand, the patient is not in good health, but is suffering from some such disease as myositis or joint changes, such as clinical experience teaches us can be caused by focal infection and by a process of exclusion all other sites of focal infection are eliminated, a very difficult procedure, then we must assume some connexion, but we should remember that it is only an assumption. Eradication of the site will prove in a few cases our assumption to be correct by the subsequent clearing up of the condition, but we are only experimenting, for we can produce far more cases in which radical treatment, such as extraction, produces no such hoped-for results. We hear all about the former and too little about the latter.

Do not think that I would have you leave such conditions untreated, be the general reaction ever so slight. The tooth and root canal must be rendered as unfavourable to the growth of organisms as possible. That alone may be sufficient to enable the tissue locally to overcome the residual infection.

A series of skiagrams over a period of time will show whether the local condition is (i) extending, in which case we have no option but extraction, (ii) whether it is remaining the same, (iii) whether the translucent area may show signs of decreasing, as a result of a regeneration of the bone, in which case we can assume that not only is the general

resistance good, but also that the local tissue has the bacterial invasion well in check.

It does not prove sterility, for we know that bacteria of a very low grade will act as a stimulant to tissue proliferation, but it would seem to me to indicate that such a tooth was not a menace to that patient at that time and to extract that tooth because at some later date with a lowering of general resistance by some extraneous cause it might become a danger, is to take up the attitude of the surgeon created by G. B. Shaw in "A Doctor's Dilemma" who always on principle removed the appendix.

In conclusion I wish to call attention to a few skiagrams (see Figures I, II, IX, X, XI and XII) showing the result of treatment in a few cases.

These skiagrams refute the statement that the radical treatment of extraction is the only treatment.

If you use skiagrams at all to make a diagnosis in these cases, you infer infection and disease because a small area of bone becomes decalcified. These photographs showed decalcified areas becoming recalcified and they, therefore, following the same inference, prove that the disease is abating and a cure is being brought about.

DENTAL SEPSIS AND GENERAL DISEASE: PATHOLOGICAL ASPECT.¹

By P. MACCALLUM, M.C., M.Sc., M.A. (New Zealand),
M.B., Ch.B. (Edinburgh), D.P.H. (Edinburgh
and Glasgow),

Professor of Pathology, the University of Melbourne.

SUCH a symposium as this leaves but little to the pathologist, since much of the pathology has already come under consideration from the radiological, experimental and clinical aspects and much must be left to be dealt with from the bacteriological point of view. It would be idle to attempt to cover the morbid anatomy and pathology of septic conditions associated with the teeth. Their importance in relation to general medicine no one will deny, but the estimates of that importance will differ according to the viewpoint much as men's opinions differ about strikes in relation to the health of the body politic.

The list of disease conditions which enthusiasm attributes to dental sepsis, is so long as to invite scepticism at least of the constancy of a causal relationship. It is, moreover, curiously similar to the list which might be submitted by a tonsillar or nasal sinus enthusiast. Each arrogates preeminence to an example of a portal of entry whose anatomical peculiarities favour the establishment of a focus of infection and of toxic absorption.

Clinical observation submits extensive evidence of an important relationship between focal infections and certain manifestations of disease and it is

¹ Read at a combined meeting of the State Dental Society of Victoria and the Victorian Branch of the British Medical Association on September 25, 1928. By arrangement this article appears simultaneously in the *Australian Journal of Dentistry* and *THE MEDICAL JOURNAL OF AUSTRALIA*.

necessary to sift that evidence with the utmost care to find whether the conclusions and generalizations from it can be justified.

The ingestion of material polluted by the presence of dental or periodontal sepsis and in consequence adversely affecting the condition of the rest of the alimentary tract is one method by which disease in this region may secondarily menace health. This aspect does not come under the present review which is concerned mainly with the two affections, *pyorrhœa alveolaris* (to retain the common terminology) and apical infection.

Pyorrhœa and apical infection are indeed only special examples of the more general problem of the resistance of the body to infection, that is, the balance between the invasive power of the bacteria and the defence.

In few other tissues is the importance of normal nutrition (in a wide sense) during the period of development more strikingly seen than in the teeth, not only in respect of normal development alone, but also of the power of resisting external assaults. In the light of modern inquiry ideas of what constitutes normal nutrition are becoming clearer. Though the direct relationship between the nutritional deficiency and failure of the defensive mechanism is not perhaps so readily traceable as in younger subjects, it is beginning to be realized that the requirements of the adult are no less exacting than those of the child.

Recent evidence points to *pyorrhœa alveolaris* as essentially part of a more general condition of impaired nutrition. Infection, though it may in severe cases produce definite local changes, is in this view secondary. The condition is marked by swelling and recession of the gums, atrophic changes in the alveolar bone, abnormal downgrowth of epithelium along the surface of the cementum and the formation of pockets with or without concretions between the gums and the teeth. There is consequent exposure, loosening and it may be complete exfoliation of the teeth. Added infection may lead to cellular infiltration in the gum tissues; in very severe cases ulcers, usually small, with purulent exudation occur in the pockets; the process may even go on to lipping, guttering and sclerosis of the alveolar bone. While such gross changes do occur and extensive disease of this nature may be serious in itself, as a source of septic absorption by way of the blood and lymph streams, the importance of the forms more commonly met with has probably been exaggerated, particularly from inaccurate estimates of the extent of the ulcerated surfaces. The evidence for a basis of nutritional disturbance has roused more than a suspicion that a primarily symptomatic local condition has been given the importance of a disease *sui generis*. The issue is a practical one calling for due consideration of the weight to be given to the factors involved, for it is clear that local treatment or wholesale extractions without regard to the general underlying condition can only result in frequent disappointment.

More important perhaps are the claims of the relationship between apical infection and general disease.

It may be taken as axiomatic that the pulp of a dead tooth always becomes infected, either by way of the blood stream which is probably rare, or *via* the dentinal tubules. Most commonly the death of the pulp is brought about by the invasion of organisms through breaches caused by caries. Exceptionally in the course of such a process the apex may be sealed off by cementum and the cavity cleared of its contents by bacterial action. More commonly the process extends through the foramina into the tissues round the apex, while exudation into the pulp cavity continues to supply pabulum for the organisms present. The results of such an exposure of the tissues at the apex of the tooth to infection will depend on the pathogenicity and relative virulence of the organisms that gain access. These may be of very great variety in kind and intensity.

The special features of the infection are those of an inflammation in cancellous bone, in an area in which there is but a restricted drainage provided by the narrow foramina leading to the pulp chamber, an exit which is cumbered with *débris* and may be indeed cut off from direct communication with the developing focus.

The inflammatory reaction develops with intensities varying from leucocytic infiltration (the cellular characters differing according to the nature of the infection) without much bony change, through grades of osteolysis, widening of intertrabecular spaces, freeing of bone corpuscles, disappearance of calcium salts, removal of bone by osteoclasts, to the ultimate production of an area of frequently very vascular granulation tissue in which osseous characters are not evident. The centre of this may be necrotic and full of pus corpuscles. Frequently its margins are ill-defined. In other cases fibrous tissue walls it off. Beyond it occasionally the opposite process of osteosclerosis may be seen. Similarly cementosis may be stimulated at varying levels on the teeth affected. As the process extends, the denser bone beyond the alveolar bone is affected, stimulation of the periosteum may lead to bony deposition and reaction to the presence of the deeper septic focus may be seen in the overlying soft parts. Further extension may end in the discharge of purulent contents into the buccal or nasal cavity or elsewhere.

But it is not so much variety in the morbid anatomical picture that concerns us here as evidence that may be adduced that a particular focus is a source of danger to its possessor and how far that pathological picture can be correlated with the evidence obtained in other ways. Can an estimate be formed from the pathological picture of the degree of danger that exists from the escape of organisms or toxins? Attempts have been made to establish such a correlation.

As a rule the formation of a wall of fibrous tissue round a focus is regarded as a sign of successful

resistance on the part of the tissues and as resulting in a limitation of the escape of both bacteria and their products. It has been claimed that osteosclerosis is a sign that active toxic absorption is occurring and that the detection of this change radiologically is of serious import. In most cases sclerosis is not marked and the estimation of the extent of its development by this method is technically somewhat uncertain. Moreover, in bone elsewhere such stimulation of bony condensation is not usually regarded as having any such significance, but rather as indicating chronic toxic action of low grade and as defining the radius of its influence. The evidence of a clinical correlation is not convincing, nor does experimental work as yet offer support to this idea.

The character of the leucocytic and tissue response may give some indications of the general nature of the invasion, but though it may from vascularity and failure to form recognizable barriers suggest opportunities for the escape of both bacteria and toxins, such clues to the potential danger of these lesions are partial and their evaluation difficult. There is no satisfactory guide to the possible consequences of dissemination from such foci. Nor is there any local feature in addition to the disappearance of bony tissue from an area round the apex that will enable us to differentiate radiographically an infection which may have grave secondary results from one in which the effects are not of any serious moment.

There are other considerations in addition to the nature of the reaction that have an important bearing. Though the locally destructive process may be due primarily to the presence of organisms which are of no metastatic or toxic importance, the presence of such a lesion may afford later opportunity for the access of organisms which are not so innocuous. In the presence of the latter, what stage is significant? It seems improbable that while the infection is confined to the pulp cavity, serious general effects can be expected. When extension occurs beyond this point, the process develops in a confined space, drainage is limited or non-existent and the only outlets for the products are the blood and lymph channels. The importance of the estimation of the progress of the lesion and the efficacy of the application of logical surgical principles in clearing up the local condition have already been presented to you. But lacking such treatment or the establishment of drainage by natural means, the supervention of secondary manifestations must depend on the turnover in the production of diffusible toxic substances and the opportunities for escape of pathogenic organisms coincidently with circumstances favourable to their establishment elsewhere in the body. Quantitative considerations would suggest that the latter is the more important, but however that may be, the factor of time must stand in important relation to both. This factor is also of the greatest importance in the consideration of fluctuations in the activity of the focus, variations in the general resistance from whatever cause and the establishment of special susceptibilities in certain tissues.

There is yet a further question of importance in treatment and prognosis which is dependent on the stage which the process has reached. It is that of the influence of the removal of the primary focus on already established metastases. The mere statement of the question suggests the great importance of early recognition and treatment and a possible explanation of some failures in spite of an essentially correct diagnosis.

None of these necessarily brief general remarks on some of the pathological aspects of infections associated with the teeth serves to do much more than emphasize the importance of the exercise of considerable discretion in the interpretation of the evidence, radiological and clinical, of the precise relationship of peridental lesions to disease elsewhere in the body. The very frequency and multiplicity of such lesions increase the liability to error and make judgement difficult. An apical lesion may be clearly associated with a certain train of secondary symptoms. A widely different lesion may be associated with a similar secondary result. Another, clinically, radiographically and histologically indistinguishable, may have no such association. Any of these lesions may be associated with a totally different train of symptoms. There may be no dental lesion discoverable in the presence of symptoms which many would regard as very strongly suggestive of a dental focus. The bacteriological evidence is scarcely less equivocal.

There nevertheless remains the impression, nay, with many the conviction, that a direct causal relationship between dental lesions and many manifestations of disease in the body does exist. The difficulties are those of the more general problem of focal infection and its consequences. The particular problem is one which concerns both dentistry and medicine and emphasizes their interdependence. The mutual advantages of cooperation on the part of workers from both professions are obvious, while the subject is one of such importance as to merit the most vigorous and rigorous investigation.

SOME BACTERIOLOGICAL ASPECTS OF APICAL INFECTION IN ITS RELATION TO GENERAL DISEASE.¹

By C. H. KELLAWAY, M.C., M.D., M.S., M.R.C.P.,
Director of the Walter and Eliza Hall
Institute of Research in Pathology
and Medicine, Melbourne.

THE question of the relation of foci of infection at the apices of pulpless teeth to certain lesions affecting other tissues of the body is one of great theoretical as well as practical difficulty. That a relationship may and sometimes does exist between dental infection and conditions such as iritis, fibro-

¹ Read at a combined meeting of the State Dental Society of Victoria and the Victorian Branch of the British Medical Association on September 25, 1928. By arrangement this article appears simultaneously in the *Australian Journal of Dentistry* and *THE MEDICAL JOURNAL OF AUSTRALIA*.

itis, neuritis, nephritis and polyarthritis is attested by a large and steadily increasing volume of clinical evidence. Many cases can be cited in which the removal of infected teeth has given rise to general reaction or to a "flare up" in the associated diseased condition and later to amelioration of symptoms.

These definite and striking clinical findings should not, however, lead us to the conclusion that all infection at the apices of pulpless teeth is either actually or potentially dangerous nor to indiscriminate advocacy of the removal of all "dead" teeth from the mouths of our patients. The fact that the incidence of pulpless teeth in any random sample of the general population is extremely high in comparison with the low incidence of the associated general conditions mentioned above must be given its due emphasis.

Wilkinson⁽¹⁵⁾ has shown that in one hundred consecutive hospital patients between twenty and forty-five years of age, the average is two pulpless teeth per patient and about half of these teeth show definite radiographic evidence of infection in the shape of well defined translucent areas at the root apex. That this should be the case, despite the frequency of treatment by extraction in the hospital class, affords a definite indication of the frequency of this condition. Haden's⁽⁴⁾ figures derived from the study of seven thousand dental radiograms from five hundred patients including adults of all ages indicate that 91% have pulpless teeth, 68% have periapical rarefaction and that there is an average number of 3.9 pulpless teeth per person in the sample investigated. Normal radiograms do not exclude the presence of apical infection, since of three hundred and seventy apparently normal teeth, 42% gave positive cultures in Rosenow's medium, while two hundred and seventy-eight teeth showing periapical translucent areas in radiograms gave 61% positive cultures. In a further study the same author⁽⁵⁾ finds that in three hundred and ninety-two living teeth 14% gave one or more colonies, 5% ten or more colonies and 1% over one hundred colonies. Of nine hundred and fifteen pulpless teeth 61% gave one or more colonies, 51% ten or more colonies and 33% over one hundred colonies when cultured in Rosenow's brain agar.

In a series of one hundred teeth studied by Broderick⁽²⁾ streptococci were invariably present in apical cultures, in eighteen alone and in eighty-two associated with staphylococci, diphtheroids or an organism resembling *Micrococcus catarrhalis*. The streptococci isolated, typed according to Holman's classification, were *salivarius* (occurring forty-five times), *mitis* (thirty-two times), *ignavus* (twenty-six times), *equinus* (eleven times) and *faecalis* and *anginosus* (each six times). The proportional distribution of these organisms closely resembles that in which they occur in the saliva from normal individuals (Glynn) and Broderick has further shown that in a small series of ten cases one or more of the organisms isolated from the apices of pulpless teeth appeared to be identical, judged by the criteria which he used, with those isolated from the

patient's saliva. If Broderick's technique can be relied upon, as his control observations seem to show, it appears that most if not all pulpless teeth are infected.

Whether or not the infecting organisms are identical with some of those present in the saliva is not clear. Even if organisms isolated in pure culture from the teeth present the same characters on blood agar and the same fermentation reactions with a limited number of sugars as some of those in the saliva, these data do not afford certain proof of identity. The strains defined by Holman's classification can only be regarded as types, each probably including many varieties and if further means of separation be used and if attention be paid to the antigenic properties of the organisms, many more strains could be isolated. The number of differentiable strains of streptococci is extremely large and, therefore, evidence of identity based only on a limited number of sugar fermentation reactions and characters of growth in media, apart from consideration of the antigenic qualities of the organisms, must be accepted with great reserve. At the same time the distribution of the infecting organisms strongly supports their salivary origin.

If the infecting organisms are normally present in the saliva apart from the existence of any presumed foci of infection at the apices of the pulpless teeth and apart from absorption through the lymphatic organs, the lingual and palatine tonsils, they must during the lifetime of the individual have many opportunities of entering the blood stream by lymphatic absorption from abraded mucous membrane in the mouth or if they escape the sterilizing action of the gastric juice from the mucous membrane of the bowel. Having reached the blood stream, if they are not destroyed there or eliminated by the kidneys, they may be deposited by chance in injured pulp or in tissue at the apex of devitalized teeth in which case they would have a favourable site for growth. Organisms are frequently carried in the blood stream in normal individuals, reaching it by lymphatic absorption from the alimentary or respiratory tracts or elsewhere and coming to rest in various tissues of the body. The "serophytic" nature of streptococci and staphylococci (Almroth Wright) makes them peculiarly suitable for this form of transfer. If by chance they reach a healthy area, they would soon be destroyed by phagocytosis or by the reaction of living cells, but in any devitalized region or area previously damaged by products of their metabolism they might flourish and produce local lesions. Ultimately, if the defensive reaction is good, they would be walled off or destroyed so that it is not possible to be certain of isolating them from such secondary lesions.

In a few experiments Professor Wilkinson and I attempted to cause localization of streptococci from the blood stream into the teeth of dogs, some of which had been devitalized by aseptic destruction of the pulp, the cavity being opened and subsequently sealed aseptically. Though large doses of

organisms were used in these experiments, in only one did localization occur and here the result must possibly be disregarded since the blood culture at autopsy was positive.

In one experiment ten thousand million streptococci (isolated in pure culture from arthritic lesions produced in a rabbit by injecting a mixed culture in Rosenow's medium from the tonsils of a patient with polyarthritides) were injected intravenously into a dog after opening into the pulp of a tooth, damaging it and resealing aseptically. At autopsy eighteen days later localization had not occurred though other streptococci, possibly from the animal's saliva, were isolated from the apex of the tooth and from undamaged controls.

In a second experiment in which fifty-five thousand million organisms of the same strains were injected intravenously a similar result was obtained after eight days, the organism failing to localize at the apices of several teeth with damaged pulp.

In a third similar experiment with another streptococcus one hundred and forty thousand million were injected intravenously. One out of three damaged teeth gave a positive result at autopsy five days later, the injected organism being associated with several others. The heart blood, however, gave a positive culture.

These experiments indicate that even with very large numbers of streptococci present in the circulating blood localization in damaged pulp does not readily occur from this source, a result which is not surprising since the whole of the body is available for the deposit of the organisms and since many are doubtless eliminated in the urine.

A much more direct route is, however, available if the organisms originate from the saliva which incidentally would explain the almost invariable presence of infection in pulpless teeth. They can readily grow directly along the canals in the dentine in any area from which enamel has been removed from the tooth or enter the pulp cavity of a carious tooth directly. If, therefore, the organisms concerned are those normally present in the mouth, it is to be anticipated that infection of any devitalized tooth is inevitable.

Assuming that the organisms at the apex of the devitalized tooth are identical with those in the mouth, to what extent does the presence of this focus of infection increase the number of organisms entering the blood stream? The answer to this question must obviously depend on the local tissue reaction of the individual and it is possible that under some conditions organisms escape from time to time into the circulation, though what those conditions are, it is difficult to define in the present state of our knowledge. Admittedly it is difficult to conceive how they could in such relatively small numbers give rise to lesions specific to one tissue, but regionally widely distributed, unless the organism became possessed of special capacity for overcoming the resistance of that tissue by inflicting specific damage or alternatively unless

the tissue in question became peculiarly susceptible to the assaults of the organism.

If the organisms in the mouth of normal people already possess this "selective localizing" affinity for tissues as Rosenow terms it, it is remarkable that in view of the high incidence of dental infection, that of the associated general conditions should be low. If, on the other hand, the organisms acquire this specific power by mutation (of which, incidentally, there is no sure evidence) or if certain tissues can become susceptible to their assault, an explanation is offered of this disparity. It should be borne in mind that variation in the virulence of an organism may undoubtedly occur without any corresponding change in the cultural or fermentative or within limits of the antigenic characters of the strain.

Let us consider now the evidence upon which Rosenow bases his doctrine of "specific selective localization." He has observed that when cultures from presumed foci of infection in patients with associated lesions are injected in large doses into rabbits and the animals are killed after two or three days, there is a close correspondence between the sites of the lesions found in the laboratory animals and those in the patients from whom the cultures were taken.

Rosenow⁽¹²⁾ in 1919 has given an excellent summary of his experiments of this kind indicating the frequency of lesions in rabbits injected with cultures from presumed dental foci in cases of appendicitis, gastric ulcer, cholecystitis, myositis, neuritis, arthritis, nephritis, *herpes zoster*, keratitis and iritis. Other workers, notably Haden, have confirmed Rosenow's findings in regard to dental foci in iritis⁽⁶⁾ and peptic ulcer.⁽⁷⁾ Brown⁽³⁾ has confirmed his results in regard to cholecystitis and Meisser and Bumpus⁽¹⁰⁾ in urinary tract infections. My own observations with Miss Williams⁽⁸⁾ in fifteen cases of arthritis and seven of nephritis illustrate well the kind of results which are obtained. In rabbits inoculated with cultures from presumed foci of infection in arthritic cases 55.6% had definite joint lesions and 16.7% kidney lesions, while in those inoculated with cultures from foci in cases of nephritis 40% had kidney lesions and 13% joint lesions.

Moody,⁽¹¹⁾ though he has not exactly followed Rosenow's technique, obtained results which suggest that the organisms isolated from alveolar abscesses do not exhibit any greater tendency in the rabbit to reproduce the lesions met with in the patient than those from individuals who present chronic alveolar sepsis without associated lesions.

Rosenow has also produced experimental evidence of another kind. Working with Meisser⁽¹³⁾ he has succeeded in producing urinary calculi in 87% of dogs under experiment by infecting their teeth with streptococci isolated from the teeth of human patients with nephrolithiasis. Controls whose teeth were infected with organisms from other sources, showed a 14% incidence of nephrolithiasis. These experiments, if confirmed, provide direct experimental

evidence that the association of distant and specific lesions with localized foci of infection in man is not an accidental one.

It is interesting to note that in Rosenow's experiments four dogs whose teeth were infected with strains from foci in patients with arthritis, failed to develop joint lesions. Professor Wilkinson and I also failed to produce arthritis in dogs treated in this way with two separate strains of streptococci.

The technique adopted in these experiments was to open the pulp of the carefully isolated tooth in the anaesthetized animal and after inoculating the organism, to reseat it aseptically. Our ability to carry out such procedures is illustrated by an experiment in which two teeth were dealt with in this way. At the end of fifty-four days, when the animal was killed, the organism was recovered in pure culture from the apex of one tooth after extraction. From the other the cultures were overgrown with proteus-like organisms and anaerobes and other streptococci, evidently from the mouth of the animal, were present. In this case despite a well developed local lesion containing this streptococcus no localization took place in the joints, even in one which was traumatized in the hope of lowering its resistance.

In another experiment several teeth were opened and sealed with full aseptic precautions and streptococci of another strain isolated from a case of arthritis were introduced into several teeth; after one hundred and thirty-five days the organism was recovered at autopsy in pure culture from two out of three from apical cultures, but no obvious lesions resulted in the joints.

It has for a long time been known that streptococci from the mouth injected into rabbits in sufficient numbers will give rise to various lesions, notably in the joints and kidneys. Even if organisms be isolated from these lesions in pure culture, as is usually the case, it does not follow that they are necessarily those responsible for the associated lesions in man. The number of organisms introduced intravenously in the laboratory animals is several thousand millions and it is not fair to compare acute lesions produced in this way in one species with chronic lesions produced gradually in another, recognizing that the pathogenicity of organisms varies greatly from species to species. Finally the same organisms are not always isolated on different occasions from the presumed focus of infection. This is well illustrated by a case which through the courtesy of Dr. Sewell I had the opportunity of investigating on a number of different occasions. The presumed focus of infection was the tonsil. On each occasion arthritis was produced in the injected rabbits and on each the organism isolated in pure culture from the joints of the laboratory animals was a different one as judged by its growth on blood agar and by its fermentative characters. All the organisms isolated from rabbit lesions resembled in these characters organisms isolated at the same time by plating of direct cultures from the focus.

The real difficulty of the problem lies in the provision of a method of determining the pathogenicity of any given streptococcus for man. The effect of removal of a focus from which one or more organisms are isolated, may afford a clue, but several strains of streptococci may be isolated and the difficulty is to decide which of these is responsible for the lesions in the patient.

Solis-Cohen and Heist⁽¹⁴⁾ have introduced a method which may well be worthy of extended trial and Lowe⁽⁹⁾ has applied it to the study of some cases of apical infection.

The method depends on the bactericidal power of the freshly shed blood of the patient as the test reagent for determining the virulence of organisms to the individual. If freshly drawn blood is inoculated with bacteria to which the patient is immune, subcultures made from the inoculated blood after twenty-four hours' incubation are sterile, while those from blood inoculated with an organism to which the patient is not immune, yield growth.

A sterile applicator is applied to the part or substance to be cultured, then stroked over a rich culture medium, such as Löffler's or serum-sugar, and immediately afterwards introduced into a small, empty, sterile test tube and rubbed on the bottom and sides of the tubes. Blood is then immediately obtained from the patient's vein and about three or five cubic centimetres are placed in the empty test tube just inoculated. Both the plain culture and the blood tube are incubated for twenty-four hours, the former being thereafter placed in an ice chest to prevent further development. The clotted blood is removed from the blood tube and with a sterile platinum loop the residual blood at the bottom of the tube is inoculated on one or more tubes of plain culture medium in a thin film on the surface and incubated for twenty-four hours.

At the end of this period the plain cultures previously placed in the ice-box and those inoculated from the blood tubes are examined for organisms, the amount of growth of each organism being noted.

In Lowe's experiments material from presumed foci was inoculated into suitable media incubated both aerobically and anaerobically (direct culture) and into the patient's blood incubated twenty-four hours and then subcultured on to suitable media and cultivated aerobically and anaerobically (selective-pathogen culture).

Analysis of thirty-four cases of dental infection showed that in 57% only one of these organisms grown directly was grown in subculture from the blood, in 27% more than one organism was so obtained, in 3% no differentiation was obtained by the two methods, in 6% an organism was obtained not found by direct cultural methods and finally in 12% the subcultures from the blood were sterile. In some cases what appeared by cultural and fermentative reactions to be identical organisms, were isolated from different foci. That from one appeared by this test to be pathogenic, while that from the other focus appeared to be non-pathogenic. Clearing up the focus which yielded pathogenic organisms by this test, cleared up the condition. Lowe invokes Fleming and Allison's⁽¹¹⁾ recent studies of "lysozymic" activity of the tissues as an explanation of this phenomenon, organisms growing in

tissue deprived of lysozymic activity automatically increasing in virulence. It seems doubtful if this application of Fleming and Allison's work is justifiable, since their observations were made with organisms of very low pathogenicity.

Summing up this brief review, three outstanding conclusions present themselves:

1. There is overwhelming evidence for the causal association of some chronic apical infections with lesions in other tissues.

2. All infections at the apices of teeth cannot be regarded as being either actual or potential sources of danger to the patient.

3. The experiments of Rosenow, while they are suggestive, cannot be regarded as affording convincing evidence of the pathogenicity of streptococci so isolated for man. Until some method of estimating the virulence of streptococci in human patients has been proved to be satisfactory for organisms of low grade and special virulence, in every case presenting general symptoms of probable foci origin we shall have to decide between the extraction or the conservative treatment of all teeth with recognizable apical infection.

References.

- ⁽¹⁾ V. D. Allison and A. Fleming: "On the Development of Strains of Bacteria Resistant to Lysozyme Action and the Relation of Lysozyme Action in Intracellular Digestion," *British Journal of Experimental Pathology*, 1927, Volume VIII, page 214.
- ⁽²⁾ R. R. Broderick: "An Investigation into the Source of Infection of the Necrotic Areas found at the Apices of Pulpless Teeth," *British Dental Journal*, 1925, Volume XLVI, page 357.
- ⁽³⁾ R. O. Brown: "A Study on the Etiology of Cholecystitis and its Production by the Injection of Streptococci," *Archives of Internal Medicine*, 1919, Volume XXIII, page 185.
- ⁽⁴⁾ R. L. Haden: "The Incidence of Pulpless Teeth," *Journal of the American Dental Association*, August, 1924, page 2.
- ⁽⁵⁾ R. L. Haden: "The Radiographic Diagnosis of Periapical Dental Infection in the Light of Bacteriologic Findings," *Radiology*, April, 1925, page 3.
- ⁽⁶⁾ R. L. Haden: "Elective Localisation in the Eye of Bacteria from Infected Teeth," *Archives of Internal Medicine*, 1923, Volume XXXII, page 828.
- ⁽⁷⁾ R. L. Haden: "The Elective Localisation of Bacteria in Peptic Ulcer," *Archives of Internal Medicine*, 1925, Volume XXXV, page 457.
- ⁽⁸⁾ C. H. Kellaway and F. E. Williams: "Specific Localization of Streptococci," Supplement to THE MEDICAL JOURNAL OF AUSTRALIA, October 8, 1927, page 269.
- ⁽⁹⁾ E. C. Lowe: "Pathogen-selective Culturing in Dental Infection," *British Dental Journal*, 1928, Volume XLIX, page 457.
- ⁽¹⁰⁾ J. S. Meisser and H. O. Bumpus, Jr.: "Focal Infection and Selective Localization of Streptococci in Pyelonephritis," *Archives of Internal Medicine*, 1921, Volume XXVII, page 326.
- ⁽¹¹⁾ A. M. Moody: "Lesions in Rabbits Produced by Streptococci from Chronic Alveolar Abscesses," *The Journal of Infectious Diseases*, 1916, Volume XIX, page 515.
- ⁽¹²⁾ E. C. Rosenow: "Studies on Elective Localization," *The Journal of Dental Research*, 1919, Volume I, page 205.
- ⁽¹³⁾ E. C. Rosenow and J. G. Meisser: "The Production of Urinary Calculi by the Devitalization and Infection of Teeth in Dogs with Streptococci from Cases of Nephrolithiasis," *Archives of Internal Medicine*, 1923, Volume XXXI, page 807.

⁽¹⁴⁾ M. Solis-Cohen: "Accentuating Pathogenic Organisms in Culture by Utilizing the Inhibitory Influence of Whole Blood," *British Journal of Experimental Pathology*, 1927, Volume VIII, page 149.

⁽¹⁵⁾ F. C. Wilkinson: "The Problem of the Devitalized Tooth," *Dental Science Journal of Australia*, 1926, Volume VI, page 289.

SOME ASPECTS OF DEEP X RAY THERAPY AND MALIGNANT DISEASE.¹

By H. A. McCoy, M.B., Ch.M. (Sydney),
D.M.R.E. (Cambridge),
Adelaide.

THE employment of radiations derived from the X ray tube or from radium in the treatment of cancer is one phase in the search for some agent capable of attacking and destroying the cancer cell within the body. Not even the most sanguine supporter of radiation therapy would assert as a principle that it is possible to cure cancer by these means. There is evidence, however, that definite destructive effects can be expected on cells from the use of various types of radiations and it is possible that with the improvements and elaboration of technique in use at the present day better and more consistent results can be hoped for in the future.

Soon after Röntgen had announced his discovery of X rays it was found that the rays had a destructive effect on the cells of the skin and within a few years many of the earliest workers suffered greatly from the effects of these rays upon their skin. It was conceived that if this action on the body cells could be controlled, this effect of the rays might be applied to some useful purpose. A dose was calculated therefore to insure against destruction of normal skin and yet sufficient to produce a reaction within the skin. X rays were then applied to a large variety of skin lesions and beneficial results were achieved in many cases. Rodent ulcers appeared to be especially amenable to such treatment and it was found that the cells comprising rodent ulcers were completely destroyed by the radiation without any permanent damage ensuing to the normal skin surrounding the lesion.

Mode of Action of Radiations on Living Cells.

Various theories have been propounded from time to time to account for the effects of radiation on living cells. Before the exact nature of X rays was known, it was difficult to formulate any reason for the effects which they produced, but since it has been ascertained that they are electro-magnetic waves in homologous series with light and Hertzian waves, it has been assumed that the physical properties are similar. A graphic description of the stimulant action of radiation on tissue was given by Dr. Hayward Pinch, of the Radium Institute, London. It was he, I believe, who compared the effect of X rays on living cells to that of a whip on an ancient cart horse which has been obliged to

¹ Read at a meeting of the Medical Sciences Club of South Australia on September 1, 1928.

draw a heavy load up a steep grade. At first the horse is stimulated by the whip to make extraordinary muscular effort and the load is accordingly drawn up the hill at a bounding rate. Later applications of the whip produce successively diminishing reactions on the part of the horse until the beast is finally exhausted and dies. The analogy drawn is that under the stimulating action of the X rays tumour cells grow at an abnormal rate at first, but later exhaustion of the cell mechanism occurs and the cell dies.

A later enunciation by Bergoni and Treboudeau states that: "Immature cells are more susceptible to radiations than are those with fixed characteristics." It is, therefore, on the assumption of the truth of this statement that the *rationale* of the radiation treatment of cancer is based.

Recent work indicates that the action of radiations on cells is an atomic phenomenon. A radiation, when arrested by an atom, liberates an electron which by virtue of the impact acquires a high velocity. The friction of this rapidly moving particle generates within the atom a comparatively large amount of heat which acts as a cautery on the cell.

It has been asserted frequently by many authorities that radiations have a stimulating effect on growth of tumour cells under certain conditions and that the net result of radiation treatment may be therefore an aggravation of the original state. Certain experiments have seemed to favour this hypothesis, for example, Murphy has noted an increase in the number of lymphocytes in laboratory animals after the administration of minute masses of soft radiation. But this very example introduces the variable factor of wave length which must be considered in formulating any hypothesis on the action of radiation on cells. It has been found that variations in the wave length of the radiation used introduces new issues in the effects produced.

It seems that at present, therefore, there is not any substantial evidence in favour of a stimulating action of radiation on tumour cells. It has long been held that radiations have their greatest effects on cells when they are in a state of active mitosis. As it is impossible to calculate when the majority of the cells of a tumour will bear the process of mitosis, it seems that the division of the dose into fractions which will permit of treatment lasting over several days, should, for the achievement of this effect, be preferable to the administration of a massive dose at one sitting.

Selective Action of Certain Radiations on Particular Cells.

Work done by Moppett at the Sydney University seems to substantiate the view that certain wave lengths have a selective action on a given cell. The investigation is so far incomplete and preliminary reports only are available. The technique adopted is roughly as follows: A narrow beam of X rays, obtained by an ordinary deep therapy equipment, is directed towards a crystal which causes a dif-

fraction of the beam and an X ray spectrum is thereby produced. It is possible to ascertain the exact wave lengths of different portions of the spectrum by the use of photometric methods. Narrow bundles of rays of known and for practical purposes homogeneous wave lengths are selected from these spectra and are directed in turn on to the experiment tissue. Moppett uses for this purpose the heart muscle of the embryo chick which, after excision, is cultured on a suitable medium and incubated. The effect of each selected wave length on the growth of this embryonic tissue is observed. Controls are kept by the incubation and cultures of similar embryonic tissue which has not been subjected to radiation.

Moppett's observations have led to the conclusion that certain wave lengths have a greater effect on growth of embryonic tissue cells than other wave lengths; and further, that the combination of an effective band with another may produce no action at all on the cells. It is probable, therefore, that certain combinations of wave lengths contain elements which have on one another a neutralizing effect.

If such a theory be correct, our present method of administering deep therapy is of the nature of a "shot in the dark" and depends for its success on the presence of an excess of effective elements in the beam of radiations administered. All this is a disquieting outlook, for with our present methods of X ray generation it is impossible to produce in sufficient intensity for practical application bands of rays, such as are used in this work. The intensity available by our present methods would be hopelessly inadequate to deal effectively with cases of cancer in the human being.

And further, this work has been performed on cells *in vitro* and it is debatable whether the laws governing the effects of radiation on these cells will obtain when the radiations are applied to the cells within the living body. Such a state of uncertainty should not, however, discount the value of this experimental work which is so valuable a link in the chain of knowledge, pertaining to a subject beset with so many difficulties.

Changes in the Skin.

Following the administration of an ordinary dose of deep radiation and beginning six to fourteen days after such administration, there develops in the skin an erythema which persists for about a fortnight. The vaso-dilatation which accompanies the erythema is variable in extent and frequently traces of it remain permanently in the skin. This is due probably to a permanent alteration in the contractile element of the capillaries which lose their facility for responding to a stimulation. Increased permeability of the wall of the capillaries is another permanent effect which results in engorgement of the capillaries.

Serious injury to the skin, resulting from overdose, is characterized by a change of character of the basal cells, that is, the Malpighian layer (which

fail in their function of producing the horny cells on the surface). The proliferation of the endothelium lining the capillaries results in a constriction of their lumina and consequently restriction of the blood supply to the part. Sloughing of the infected tissues is not uncommon therefore.

Reasons for Some Failures in Deep Radio-Therapy.

It appears that sometimes the dose of radiations administered to a tumour fails to destroy all of the cells. Those which are completely destroyed, are replaced by fibrous tissues which form an irregular meshwork in which there remain islets of tumour cells which are still capable of proliferation. Although the growth of such cells is restricted by fibrous tissues which surround them either partially or completely, there yet remains a residuum of cells and of fibrous tissues which is a potential source of metastasis, even if its presence as a tumour is not undesirable. The result in any case cannot be claimed as satisfactory and further treatment is indicated.

Such cases of abortive fibrosis are particularly resistant to further radiation treatment because of the efficient protection afforded to the residual tumour cells by the dense fibrous tissues which surround them. Surgical excision of such a tumour is the only treatment which offers a chance of a good result.

Treatment of Carcinoma of the Cervix Uteri.

Of all the malignant diseases except only rodent ulcers it seems that radiotherapy has been used generally with the greatest degree of success in the treatment of carcinoma of the cervix.

Certain considerations are advisable before a patient is finally selected for treatment by radiation. A correct diagnosis is, of course, essential and microscopical examination of scrapings from the lesion is necessary in every case. It is held by some authorities that adeno-carcinoma is particularly resistant to radiations and at the Radium Institute in Paris it has been noted that this type recurs much more frequently after radiotherapy than does the epidermoid type. In such resistant conditions it is the practice in this institution to perform complete hysterectomy three to four weeks after the completion of a course of radiotherapy.

The presence of infection in the pelvic tissues surrounding the carcinoma of the cervix, forms a contraindication for radiation therapy on account of the liability to a gross aggravation of the infection, even to the extent of the development of pelvic peritonitis.

It is essential, therefore, that the radiotherapist should have the close cooperation of the gynaecologist in the selection of patients for radiation treatment. In certain clinics, radiotherapy is the only form of treatment employed for this condition. The combination of surgery and radiotherapy has been used with success in the many clinics, but under such circumstances it is, of course, difficult to assess

the respective merits of two factors in the treatment; the results obtained thereby lose much of their comparative value.

A method which depends for its success only on the effects of radiations, is employed by Voltz at the gynaecological clinic at Munich, where all patients with carcinoma of the cervix are treated by radiotherapy.

The technique adopted by Voltz provides for the use of radium and X rays in every case. The combination is considered desirable because the results obtained are more uniformly successful than when either agent is used separately.

As a preliminary to the local treatment of the carcinoma Voltz recommends irradiations of the *sella turcica*, administering a dose to the pituitary gland, equivalent to 30% of an erythema dose. A very definite and constant increase in the weight of the patient is observed within a fortnight of this application. The increase of weight is attributed by Voltz to a stimulant effect on the body metabolism *per medium* of the pituitary gland. Such patients are in consequence in an improved state to resist the carcinoma. However empirical this procedure may be, the calculated effect is obtained in almost every case and the general condition of the patient is undoubtedly improved.

X radiation is administered to the lesion through two portals, one over the hypogastrium and the second over the sacral area. By administering a full erythema dose to each of these areas it is calculated that 50% of each is absorbed in and around the area occupied by the tumour. Consequently, the effective dose of X radiation administered to the tumour is calculated to be equivalent to a full erythema dose as measured by the skin reaction. The achievement of this technique is surprising to most observers in the rapidity with which the dose can be administered. Using an apparatus capable of generating a constant high potential current of about two hundred kilovolts and with a current of two and a half milliamperes, a filter of two millimetres of copper and several of aluminium a focal distance of fifty centimetres and a portal of entry measuring about ten centimetres square, an erythema dose is administered in fifty minutes. It would be impossible to produce with an apparatus generating fluctuating voltage a similar effect in more than double the time, utilizing the given factors. This demonstrates, therefore, the efficiency of this particular type of constant high potential apparatus.

The X radiation is followed by the application of radium to the cervix itself. The procedure commonly adopted is to place tubes within the lumen of the cervix and other tubes are arranged on some form of apparatus capable of retaining them in position in the fornices. A calculation of the dose of X radiation administered is possible from a knowledge of the quantities used, the type and thickness of filters, the distances between the tubes and the time of application.

ILLUSTRATIONS TO THE ARTICLE BY DR. FRANK C. WILKINSON.



FIGURE I.



FIGURE II.

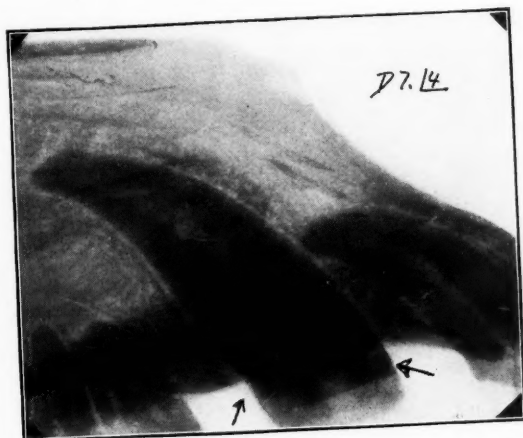


FIGURE III.

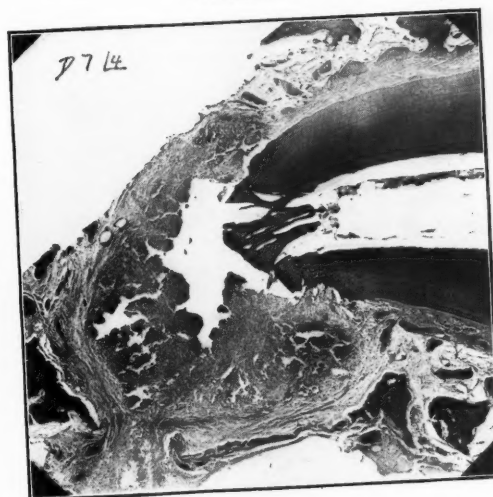


FIGURE IV.



FIGURE V.



FIGURE VI.



FIGURE VII.

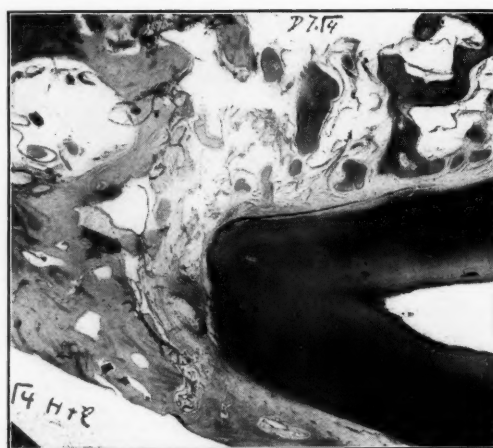


FIGURE VIII.



FIGURE IX.



FIGURE X.



FIGURE XI.



FIGURE XII.

The course of treatment extends over three or four weeks and it is repeated at the end of about three months.

The account of this method is not by any means accurate and is described only from memory of what was seen four years ago and because the results obtained by it in the hands of Voltz and Döderlein are so arresting.

Classifying the tumours in three groups according to their operability, it was found that of those which at the time of treatment were considered inoperable (and of that number only those which had been traced for three years) in about 11% were the patients alive and clinically free from carcinoma at the end of that time. The effects on border-line and operable tumours were correspondingly good. The clinical findings were controlled on each case by microscopical examination of scrapings from the site of the primary lesion.

Conclusion.

It is impossible at present to draw dogmatic conclusions from results so far obtained in deep therapy. Conditions have varied so much and the technique has been altered so frequently during the last ten years that an accurate account of the beneficial results achieved in various parts of the world is difficult to obtain.

The benefits derived in many cases are undoubted and the hopes for the future should be bright provided only that humility, honesty and accuracy continue as the keynotes of all observations in this as in all other branches of scientific research.

SOME NOTES ON THE PRACTICE OF MEDICINE IN MELANESIA.

By W. L. CALOV, M.B., Ch.M. (Sydney),
Sydney.

THE moment he steps off the island steamer and finds himself in the midst of a throng of yelling, gesticulating natives dotted here and there with Chinese, Japanese, Malays, Philippinos and others, the newly-appointed medical officer realizes that his preformed ideas on the practice of his profession in Melanesia must be subjected to some rapid revision.

While waiting for his luggage, endeavouring to make sense out of the jabber of queer pidgin-English around him, he observes several pathological conditions which he has never seen before. There on a post, blinking his red-rimmed eyes in the dazzling sunlight, squats a toothless ancient chewing betel-nut; his naked brown body is completely covered with a coarse scaly desquamation and he scratches his flanks thoughtfully.

Watching the discharge of cargo is a native boy not yet in his teens; his arms and legs are like potsticks; he has lordosis and his abdominal skin,

tight and shining, is stretched over a vastly protuberant belly.

Pushing a truck on the jetty is a full-grown native whose "sabre-blade" tibiae and curved and thickened ulnae betray the fact that he suffers from frambæsia.

The strange tongues, strange peoples and strange diseases in a strange though rich and beautiful environment, are temporarily bewildering and continue to fascinate long after their qualification "strange" has ceased to apply.

The resident of a civilized country has learnt the value of scientific medicine and has faith in those specially trained in its ministration; the Melanesian has to be taught; very often he is actually afraid, though when he can be shown a dramatic result of some therapeutic procedure, such as the injection of "Novarsenobillon" for secondary yaws, his blind faith in this particular treatment is astounding. A belief in the value of the white man's medicine generally is gradually, however, becoming more widespread and more and more natives yearly apply voluntarily for treatment.

Native Superstition.

Certain manifestations of disease, for example, the secondary eruption of frambæsia, are more or less incidental to the Melanesian's existence and he takes them as a matter of course, but any variation from the usual or any extraordinary disease he attributes either to the sorcery of an enemy or the machinations of a *masilai* (devil) or *tamburan* (spirit of the departed).

Occasionally a native sees a *tamburan* or *masilai* and in such a case his terror is dreadful. His friends treat him by chewing wild ginger (*kawawar*) and spitting on his body.

Epilepsy is always believed to be due to the influence of *masilai*. Acute mania is attributed to a similar cause, a fact which is of some value to the gentleman who works himself up into a frenzy before proceeding to assassinate a few of his neighbours.

A native boy was admitted to the Rabaul Native Hospital, suffering from tropical ulceration which eventually involved the bone and necessitated a very prolonged period of hospital treatment. His friends had no doubt but that his condition was caused through his climbing a betel-nut palm many months before in an area which had been "tabooed." Their faith in the medical officer's ability to treat the condition successfully was nil and they were most importunate in their requests that the sufferer should be sent home for treatment by their own medicine man. They explained that the disease was one of which white men could not be expected to have any knowledge; it was caused by magic and only by magic could it be cured.

Old Beili, a New Guinea native working in the North Western Solomon Island, purchased a local wife who had already been married in the mission church to a local man. The missionaries persuaded the woman's people to have her brought home.

There was some haggling over the price and the amount of compensation, if any, and so forth and eventually, when old Beili became ill, he went to hospital firm in the belief that he was the victim of sorcery. He was suffering from an attack of lumbago, which quickly cleared up, though his state of mental depression was not so easily relieved. He was given a highly-coloured, unpalatable purgative draught and was told this was a special and very potent medicine which could be guaranteed to eradicate every trace of "poison" in his body with the utmost dispatch. This treatment apparently helped him very considerably. He was an old native who had been in the service of white men for many years and had learnt to place some confidence in their medical abilities.

Charms against illness and disaster are not uncommon. Sometimes a charm consists of a stake which has been specially treated by the local medicine man (for a suitable remuneration), and driven into the ground near the house doorway. This charm keeps all evil spirits at a distance and allows the inmates of the house to sleep in comfort and security.

A not uncommon piece of sorcery is the placing of some specially prepared substance (usually lime) on a road. The intended victim walks over this at his peril. That it is not always wise to cast scorn at the sorcerer's art is shown by the following incident.

A district officer on patrol was warned by his native police at a moment when he was about to step on some lime which had been scattered on the roadway, obviously by some sorcerer with intent to bring disaster to an enemy. The district officer, scoffing at the idea, kicked the lime right and left and shortly afterwards became afflicted with a severe and very painful ulceration of the leg. To the native mind the ætiology of his condition was obvious and he was a very fortunate man indeed that nothing more disastrous befell him.

There are many practising native sorcerers who apply their magic therapeutically. For a suitable fee they will recover a piece of glass from a sick man's belly or a stinking pig's bone from a paralysed limb. These fellows sometimes have quite large practices and so intense is native superstition that, however obvious their tricks, their *clientèle* neither diminishes nor loses faith.

An occasionally successful form of treatment for headache is widely practised through Melanesia. A line of small shallow vertical incisions is made across the forehead with a sharp shell or piece of glass, the object being to provide an outlet for the evil spirits or "poison."

"Salvarsan."

In any areas where medical patrols have been conducted, the native has the greatest faith in the therapeutic value of "Novarsenobillon" or really any prick with a needle. In the effective treatment of the generalized secondary eruption of frambœsia (seen mostly in young children) "Novarsenobillon"

injections are quite dramatic. The scales drop off and the yaws dry up and heal within a few days after one injection. The native has thus come to regard the drug as a panacea. Many thousands of natives annually request injections at the various hospitals through the Territory of New Guinea and as they have all at some time or other suffered from frambœsia, very few are refused treatment. It is a fact also that many of their complaints, such as pains in the long bones and feet, are actually symptoms of tertiary frambœsia and are relieved by "Salvarsan" treatment. Incidentally this blind faith in "Novarsenobillon" is not confined to the natives; Europeans often ask for it and Japanese and Chinese often expect it to accomplish miracles. "Salvarsan" poisoning would appear to be a very rare condition in the Territory of New Guinea.

Dysentery.

Bacillary dysentery is probably the most awful disease in Melanesia, especially when it occurs as an epidemic.

The Flexner bacillus is the responsible organism in the Territory of New Guinea. In well-nourished European adults the disease does not appear to be very dangerous to life, but in natives, especially those who are already in a state of malnutrition, it is very often fatal. Within three days bacillary dysentery may transform a big, powerful, glossy-skinned native into a filthy, emaciated wretch, lying naked and whining on the floor of his house with pus and blood oozing incessantly from his anus. The task of treating such a patient is hopeless. He is almost sure to die.

Raw recruits newly arrived from the bush are especially apt to contract dysentery. No doubt the sudden change of diet from their customary native foods to one of rice and tinned meat has much to do with this. These wild bush boys are considerably more difficult to handle than more civilized natives. Lacking in appreciation of the white man's skill and authority and unable to speak his language or understand his peculiar methods, they are very apt to lose all hope quite early in their illness or, when improving, to crawl away and fill their bellies with a mess of rice and meat.

The experience of medical officers in Rabaul would indicate that antidyenteric serum is useless unless administered within the first twenty-four hours of the illness, when it is of very great value.

Pneumococcal Infections.

Masilai and *tamburans* throughout the Territory of New Guinea have many pneumonia deaths to account for. Melanesians are highly susceptible to infection by the pneumococcus. Pneumonia is common and has a high mortality rate, while pneumococcal meningitis, pericarditis and peritonitis occasionally occur. In one epidemic in Rabaul there were seen in the *post mortem* room several bodies in each of which all four conditions were present. It would, however, appear that within

recent years the native has been gradually acquiring some greater degree of resistance to the pneumococcus. Infection of the meninges, pericardium and peritoneum has been seen but rarely, while the pneumonia mortality rate has been lower recently. This, of course, may be due merely to the lower degree of virulence of the causal organism. Only statistics over a long period can provide any very valuable information on the point.

Tuberculosis.

As in other tropical countries the white man and Chinese have introduced the tubercle bacillus with disastrous results. Of all imported diseases tuberculosis is the most lethal and the most disabling. Tuberculous disease in a native appears to be almost invariably progressive and pathologists have noted the extreme rarity of healed tuberculous lesions in the cadaver.

Leprosy.

Leprosy is prevalent and appears to be spreading gradually throughout the Territory of New Guinea. The Chinese are no doubt responsible for its introduction. Having seen a few lepers, the medical officer finds little difficulty in diagnosis as a rule, but early infections are easily missed even by the expert, when big numbers of natives are being examined and reliance has to be placed on one's ability to make "spot" diagnoses. The difficulties in the way of successful treatment of leprosy in Melanesia are great. There has been abundant proof of the value of segregation and this is at once the most important and the most difficult procedure to put into effect. The recognition of the disease amongst ignorant natives who are endeavouring to hide it, the apprehension of the sufferers and their transport to a leper settlement, present difficulties for the surmounting of which no satisfactory means have yet been devised in the Territory of New Guinea.

It is indeed unfortunate that in such a fine field as this, where leprosy is a new disease, research should be hampered by the low intelligence of the native inhabitants.

Ulcus Tropicum.

More than 50% of the natives in hospitals throughout the Territory of New Guinea are admitted for treatment of tropical ulcer or as Manson terms it "tropical sloughing phagedæna." Economically this is probably the most important disease in Melanesia. Its incidence among labourers is high and it incapacitates for long periods. It varies in severity from a small superficial ulceration to a filthy phagedænic process involving muscles, periosteum and bone and producing a toxæmia of such a severity as to be not infrequently fatal. There is no condition in modern civilized practice comparable to this disease, though it bears a great resemblance in many respects to the appearances described of the old hospital gangrene. *Ulcus tropicum* occurs only on the lower extremities. Early and energetic treatment is demanded and surgical inter-

ference is frequently necessary. Dressings are mostly carried out by trained native orderlies who become quite skilful at the work.

Deficiency Diseases.

As might be expected in a tropical country food deficiency diseases are rather frequently seen. Beri-beri is common among indentured labourers, particularly among raw recruits before they have either adjusted themselves to their new dietary or discovered ways and means of obtaining necessary fresh food. It is of interest to note that in upwards of eight years' experience, the writer did not see a case of so-called wet beri-beri. Vitamin C deficiency is noted in the liability to infection of the gums and mouth, seen more especially also in raw recruits. Sometimes this "New Guinea sore mouth" as it is called, sweeps as an epidemic through a whole labour line, occasionally proving fatal. Fresh food and "Salvarsan" usually clear up the condition rapidly. Rickets is practically unknown, for the obvious reason that only in very exceptional circumstances are infants fed artificially. If a mother dies or has an inadequate milk supply, her baby dies. In the Territory of New Guinea the missions and the administration do what they can to institute artificial feeding when necessary and it would appear likely that as their activities in this respect are extended, so will the incidence of rickets increase. Results may prove interesting in view of recent knowledge concerning sunlight and vitamin D. The ignorant natives cannot be depended on to carry out with any degree of efficiency instructions for the proper feeding of their infants according to modern methods. Evidence of vitamin A deficiency is seen in the liability to certain diseases of the eye.

Malaria and Blackwater Fever.

To the white resident of Melanesia malaria is the most important endemic disease. Very few avoid infection. The disease is the commonest cause of invalidity and loss of time among European residents.

In making a diagnosis in any febrile condition malaria should always be considered and quinine administered when doubt exists without loss of time. There is seldom any danger in administering quinine, but there may be grave danger in withholding it. The medical officer has to beware, however, of falling into the habit of dubbing every fever malaria. On the other hand, the manifestations of malaria are many and diverse; such a condition, for example, as an apparent dysentery with choleraic diarrhoea might easily deceive the insufficiently observant medical officer as to its malarial origin.

Malaria is apt to be regarded too lightly by the European residents of Melanesia. Most of them treat themselves, very few take sufficient quinine and they fail to recognize that their crying need for a periodical vacation in a temperate climate is concerned far more with recurring attacks of malaria than with heat and humidity.

A discussion on the aetiology of blackwater fever does not come within the scope of this paper; suffice it to say that it is now generally regarded as a sequel to recurring attacks of inadequately treated malignant malaria. In blackwater fever there is hæmoglobinuria, disturbance of kidney function, severe icterus, enlargement of liver and spleen, fever and as a rule profound toxæmia. Its treatment leaves much to be desired and in fact is mainly symptomatic. Whatever measures are adopted, the disease is often fatal, sometimes even after the urine has become free of hæmoglobin and albumin. There is much yet to be learnt about the aetiology, pathology and therapeutics of blackwater fever. Manson's theory of specificity may yet be proved correct. Fortunately the condition is not very common in the Territory of New Guinea.

It is not definitely known whether or not malaria is largely concerned in the high rate of native infantile mortality. The Melanesian certainly possesses some degree of racial immunity from malaria and acquires a further immunity through constantly repeated attacks from infancy onward. When he has reached man's estate he may still be subject to occasional mild paroxysms, but it is rare for a paroxysm to recur as it would in a non-immune. If the blood of a number of apparently healthy labourers be examined, it is probable that in some 2% or 3% malarial parasites will be found. It will thus be seen that the actual relief of symptoms of malaria in a native does not as a rule present much difficulty, though it is undoubted that quinine therapy is of value in the improvement of the native's general health. The administration of quinine to natives is important from a public health point of view, in that it assists in the prevention of malaria by eliminating the source of infection.

All due apologies are offered for these few sketchy notes. They are not intended as a learned contribution to the study of tropical medicine, but it is hoped they might prove of some general interest. If they succeed in providing entertainment for an occasional weary practitioner during an idle half hour, they will have attained their object.

THE WORK OF A PSYCHIATRIC CLINIC IN A GENERAL HOSPITAL.¹

By H. C. McDOWALL, M.B.,

Honorary Psychiatrist, Royal North Shore Hospital of Sydney.

In fulfilling my duty as retiring President of the Section of Neurology and Psychiatry by giving a valedictory address, I think it may interest you and possibly do some good by publication if I give you an account of the work of a psychiatric clinic in a general hospital.

I had the honour of opening the Psychiatric Clinic of the Royal North Shore Hospital of Sydney

on September 8, 1926, for out-patients only. Two patients only presented themselves that day, but the numbers gradually increased till now, when they amount to eight or ten, occasionally more, on one morning a week.

So far no beds have been allotted to the specialty in this hospital, so that the work has necessarily been confined to outdoor patients, with the exception of those patients under the care of other physicians or surgeons, seen in consultation with them in the wards of the hospital. They are not included in this report. This restriction to outdoor treatment only has militated against good results in some of the patients, but through the kindness of Dr. Jones, of Broughton Hall Psychiatric Clinic, several of my patients have been admitted there with good results.

About one hundred patients have so far availed themselves of the clinic and I have classified these in the following table.

TABLE I.

Condition.	Number of Patients.	
	Females.	Males.
Anxiety neurosis	1	—
Gout	3	—
Neurasthenia	20	10
Hysteria	15	1
Epilepsy major	6	—
Epilepsy minor	3	4
Habit spasm	2	3
Congenital mental deficiency	2	2
Dementia præcox	1	4
Psychoses	6	4
Cerebral syphilis and general paralysis of the insane	—	—
Parkinson syndrome	—	2
Nervous debility	—	1

You will notice that a large proportion of these (forty-six) are neurasthenics or patients suffering from hysteria and that comparatively few (ten) have a definite psychosis. This has been disappointing in a way, as one hoped by getting patients with incipient insanity to come for treatment early, one might do something to lessen the numbers finding their way eventually to a mental hospital. Indeed, of the few patients seen, the majority were ex-patients of mental hospitals and their condition was more or less of the chronic type. However, it is quite likely that a good many of the neurasthenic, hysterical and epileptic patients dealt with are or it is to be hoped were on the road to definite mental trouble.

It is possible, nay, I think likely, that in time more and more potential or incipient psychotics will present themselves at the clinic and so not only stimulate the interest of the physician in his clinic, but do a material service to the community by reducing the incidence of certifiable insanity.

The neurasthenic and hysterical types of psychoses (I bracket the two together, for one frequently finds it impossible to draw a hard and fast line between the two diseases) are often interesting, but apt to pall a little, to put it mildly, as so many of them, to the physician's discredit be it admitted,

¹ Read at the annual meeting of the Section of Neurology and Psychiatry of the New South Wales Branch of the British Medical Association on December 7, 1928.

fail to respond satisfactorily to all treatment and their affections become chronic; relapse is very frequent even in the patients who have apparently at first improved.

Most of the epileptics in the list have been children from the ages of four to sixteen years and they have done very well as regards diminution and in some cessation of fits. I have found "Luminal" in moderate doses of from 0.045 to 0.12 gramme (three-quarters to two grains), usually twice a day, after breakfast and at bedtime, very effectual, but I have frequently combined this treatment with comparatively small doses of bromides and usually with salicylate of soda in 0.3 to 0.6 gramme (five to ten grains) doses three times a day. Sometimes a double dose is given at bedtime.

I am a believer in acidosis playing some part in epilepsy, either causative or exacerbating and I think that sodium salicylate is a great help in eliminating uric acid or its congeners from the system. Whether I am right in this hypothesis or not, I find that practically by adding 0.3 or 0.6 gramme (five or ten grains) of this salt to each dose I can reduce the dose of bromide necessary and considerably relieve the patient's headache, depression and tiredness. The eliminating influence, too, of small doses of calomel, 0.03 to 0.06 gramme (half to one grain) every other night or even only twice a week, is very satisfactory and if there is any evidence of constipation I usually prescribe this, but only as an adjuvant to other remedies for constipation, such as cascara, compound liquorice powder, Epsom or Glauber salts and petroleum oil.

I have found citrate of potash very useful for some patients with neurasthenia, combined with small doses of bromide and either some form of phosphorus or strychnine. The rôle played by the citrates is not quite clear, but I think probably depends on their power of combating excess of acid in the system.

Although I do not practise any form of hypnotism myself, I am inclined to think there is some use for this in psychiatric practice; I make use of ordinary suggestion to a considerable extent in most of my patients, as I am a strong believer in the potency of mind over matter and if one can induce a patient to look hopefully forward to cure or relief, a great advance has already been made.

As regards glandular therapy I have not made much use of the preparations on the market with the exception of thyroid extract which I have found of benefit, particularly in a neurasthenic with some evidence of myxœdema. I think "Hormotone" with or without pituitary, according to the blood pressure, would be useful for some patients suffering from neurasthenia. I have found several patients with high blood pressure among my neurasthenics; I think this was an important factor in causing the sensations complained of.

For two patients manifesting Parkinson's syndrome I have tried increasing doses of tincture of belladonna instead of hyoscine hydrobromate and I think in one of them, a lad with some degree of *dementia præcox* combined, with a very satisfactory

degree of success. This lad has gained weight considerably, has lost his tremor, is a good deal more active and the mask-like appearance has almost disappeared. His dementia persists.

I have had only five patients with definite *dementia præcox* apart from the lad above mentioned, in whom it was combined with the Parkinson syndrome, but I think there is no doubt that there is an increasing number of sufferers from this form of insanity and as the prognosis is usually not good, the importance to the community of this disease is very evident. Anything which throws light on its ætiology is worthy of close attention. In an interesting article by Lieutenant-Colonel W. S. Jagoe Shaw, M.D.,⁽¹⁾ the author stresses the idea that consanguineous marriages play an important part in the production of children excessively prone to develop *dementia præcox*. Instancing the case of the Parsee community of Bombay Presidency, he found no less than 52% of this disease among his hospital patients and 48% among the private patients in his psychiatric practice. As he explains, close inbreeding is a characteristic of the Parsees.

As W. A. White puts it:⁽²⁾

Every individual born into the world has, if it could be determined, a definite potentiality for development. The force of the impetus which starts it on its path is sufficient to carry it to a certain definite distance. In the subject of this disease (*dementia præcox*) the original impetus has been weak, and when its force is spent, mental development stops and the retrograde process is hastened or initiated by some special or mental stress occurring at the critical point of puberty and adolescent evolution.

As Shaw put it:

May not the initial weakness in or injury to the germ-plasm be due in cases of continual inbreeding to a similarity of germplasms being detrimental to each other.

However, inbreeding can be only one of several predisposing causes, as I do not think inbreeding in that sense is common among the general population of this country. We must look for other causes. I think that alcoholism in the parents or even the grandparents is among the likely causes.

Hysterical conditions have varied much in degree and in the absence of disciplinary treatment combined with suggestion obtainable only in the wards of a hospital, I have had to rely on a general tonic treatment with a good deal of suggestion. One patient with hysterical aphonia did not improve till I ordered a course of electrical treatment and massage for her neck and throat, when she quickly recovered her voice. Another patient with habit-spasm or tic was considerably benefited by similar treatment and is now, I hear, after a change of air, quite recovered. I have had the experience of, I think, most practitioners, that habit-spasms are very difficult to control effectually. I have had two patients suffering from stuttering referred to me for treatment, but as I have had no experience in the elaborate and prolonged technique advised in the treatment of this condition, I declined to take them in hand.

Personally I am rather of the opinion of London *Punch* who years ago gave an illustration of an unfortunate stutterer entering a shop to purchase

"a pair of w-w-w-white g-g-g-gloves" and the shopman, stuttering worse than the customer, advised the latter to go to Dr. Jones, "for he cu-cu-cu-cured me."

Of the few patients with mental affections the most satisfactory were those suffering from mild melancholia which yielded readily to treatment, though in some not till a change of air and environment was insisted on. I do not find it necessary as a rule to employ any preparation of opium for these patients, though in more severe conditions in patients in mental hospitals I have had to rely on it. Sleeplessness I find controlled usually by "Dial" or at times better by "Luminal" if drugs are necessary, which is not always the case. The most unsatisfactory conditions from a treatment point of view are those of chronic delusional insanity, such as obsessions and paranoia, though sufferers may by the absurdity of their delusions raise more than a smile among the staff. One of my patients, an old lady, was greatly troubled by strange animals, "something like snakes," which she said infested her breasts and made their way under her skin, up into her ears where they mocked her or made fun of her, or into her mouth where they lived on the food she attempted to eat, grumbling if it was not to their taste, their particular antipathy being bananas of which she herself was very fond.

As regards paranoics my experience goes to confirm that of Kraepelin that these, though very troublesome and even dangerous when first certified and sent to a mental hospital, settle down after possibly a somewhat long detention there, and then improving, if released, may continue outside quite successfully even earning their own livings and being useful citizens, though they still retain their old delusions. They, as it were, have reeducated their mental processes or readjusted them so as not to contend with or offend the opinions or prejudices of those with whom they come in contact.

In conclusion I think there is no doubt that the action of the Inspector-General of Mental Hospitals (Dr. Hogg) in impressing on general hospitals the advisability of establishing psychiatric clinics as a part of their regular work, has been a wise one and justified by the results even so far. Personally, I have been very pleased with the work at the North Shore Hospital.

References.

- ⁽¹⁾ W. S. Jagoe Shaw: "The Heredity of Dementia Præcox," *The British Medical Journal*, September 29, 1928, page 566.
⁽²⁾ W. A. White: "Outlines of Psychiatry," 1919.

SOME SURGICAL DEVICES.

By J. FORBES MACKENZIE, M.B., Ch.B.,
*Surgeon to In-Patients, Saint Vincent's Hospital,
 Melbourne.*

I TRUST that I may be pardoned if the dodges described here are considered too elementary, but they have all saved me so much trouble that I am

sure that someone will be pleased with at least one of them.

Suture of the Peritoneum.

The first is a method of overcoming the difficulty of suturing the peritoneum and posterior sheath of the rectus.

Every one knows how difficult and vexing this can be at the end of a long and trying operation. Of course, by making a transverse incision instead of the usual incision in the long axis of the body and by this I mean the incision through sheath and peritoneum, the muscle being either split or retracted, the matter of sewing up can be much simplified and this transverse opening of the sheath is an expedient well worth adopting. I always use this method in gall bladder operations, as I find that I can do all that I want through the opening. At any rate, the opening can be enlarged upwards or downwards if more room is required. However, let us suppose that the sheath has been opened longitudinally and as so often happens, there is difficulty in closing owing to various causes, such as friability of the tissues causing every stitch to cut out, or when the patient is not breathing well, an annoyance that usually occurs in this particular type of case for some unknown reason. As much time can be wasted on the suturing as would suffice for the whole operation. I have had some very annoying experiences when carrying out this form of suture. Sutures cutting out in this locality no longer irritate me, since I have adopted the following method of coping with them.

Take a stout catgut and tack it loosely along each margin of the opening in the posterior sheath. This leaves you with an opening along each side of which there is at a distance of, say, a centimetre and a quarter (half an inch) from the edge, a loosely tacked piece of gut. In suturing place the stitches outside this loose catgut and all the nuisance of cutting out is at an end, as the loose catgut affords support to the fragile tissue. It may be suggested that by taking a bite of muscle the same result may be obtained, that is if the muscle has been split; but oftentimes the muscle also is very weak and it gives way, adding to the trouble. Try this stitch with thread and a piece of fragile fabric such as thin silk, and you will see how easy it is.

Controlling Hæmorrhage from Soft Tissues.

A device that I have found helpful in cases of bleeding, either primary or secondary, from soft yielding tissues, such as the rectal wall or the urinary bladder or in fact any soft tissue in any part of the body, is as follows.

Take a piece of cloth about thirty centimetres (a foot) square. A sterile pocket handkerchief will do quite well and is about the right size. Through the centre of this cloth push the points of a Morrison's forceps slightly separated, so as to allow the forceps to take a bite. Grasp the bleeding point with the points and close the forceps. Then pack gauze inside the space between the handles and the cloth. If an attempt is made to pack a cavity in soft

tissues, it will often be found that instead of getting pressure on the bleeding point, this point is only pushed deeper in and no pressure at all is exerted where it is required. The points of the forceps hold the bleeding point to the packing and allow pressure to be applied where it is of some use. This method is useful in a case of hæmorrhage after an operation for hæmorrhoids or some such condition. Try this with a piece of cloth and a toothed forceps such as a Morrison's, and it will show you how it can be applied. I have used this method many times in the past and have found it very useful.

Acute Retention.

It sometimes happens that in certain forms of retention no instrument can be inserted and the worry of a suprapubic tapping has to be faced. This is always a nuisance, as it is not always convenient to arrange at the time and under the conditions in which we find the patient, to do the operation we would like to perform. As a matter of fact, the patient may be at a great distance from a situation where the conveniences necessary for such a procedure exist. A breathing space is required until arrangements can be made for transport. A method that I have found of great help under such circumstances is as follows. Use a large sized trocar and cannula and have at hand a catheter small enough to pass through the cannula. Drain the bladder and then insert the catheter into the bladder, pushing it in far enough to allow of a little slack, the reason for this being that when the cannula is withdrawn, the catheter is not so liable to be dragged out. The cannula is now pulled out and the catheter will be gripped by the abdominal wall and prevented from slipping out. This catheter will be found to act quite well, the patient will be comfortable and a breathing time will be afforded to all.

I remember finding this method a great comfort in an old man with retention whose prostate I had removed for a malignant growth. He was very broken down and would not even have stood a suprapubic cystotomy. The catheter was left in for two or three days; the bladder drained perfectly and by this time fortunately he began to void naturally and continued to do so until his end which was a considerable time after this happening.

Hot Weather Operating.

A comfort affording device when operating on a hot day in a hot theatre is to remove one's socks. Wearing a pair of sandshoes one can keep quite cool and not feel half so done up after doing a long or difficult operation.

A New Type of Operating Bag.

For some time past I have been using a new type of operating bag and it has been such a success that I am recommending it to anyone who is dissatisfied with his present bag. It was the bag that I previously carried around that made me try to get something not so cumbersome and something that would not get into disorder after it had been opened once.

I previously had a large bag which held a great number of things, but which easily got into a state of confusion, especially if one were operating at, say, three different places one after the other. What happened was what happens to every one's bag. In order to get away in a hurry to the next place, I would probably bustle the theatre sister at the first place and the instruments would be dumped in hurriedly and then after two or three of these dumpings there would be a regular mix-up. The bottom of the bag, of course, would be a litter of odds and ends, broken instruments and bits of rubber tubing. These things especially have a way of accumulating and being forgotten; although, perhaps, every one is not so untidy as I am.

The bag I am using now does away with all that sort of thing, as it is easier to put things away in an orderly manner. It consists of a series of trays, which open out something like a concertina or at any rate like a Samway's dressing case, only that the bag opens both ways. This allows of all the trays being directly under observation as soon as the two sides are drawn apart. The top tray on either side is divided into three spaces by partitions and these spaces are useful for small articles like needles, knife blades, horse-hair and so on. At the bottom of the bag there is a deeper tray which is not divided, and which will take larger instruments, such as retractors. The other trays on each side are not divided and carry forceps, clamps and so on; so that once arranged there is little excuse for anyone who cannot put the instruments back in an orderly manner after they have been taken out.

This bag is of a very convenient size: it measures fifteen inches in length, seven inches across and seven and a half inches in depth. If tube catgut is used, it will hold all the instruments and material that are required for any operation inside or outside the abdomen. Theatre sisters who have used it, say that it saves them an immense amount of trouble, as it is easy to pack and to unpack.

It was made for me in Melbourne and the price is very reasonable.

Perhaps I ought to mention that the trays are made of light metal covered with thin sanitary sort of oilcloth and there is a good quality leather outside case. I think the bag is a very neat bit of work.

Reviews.

CARDIAC DISORDERS.

THE second edition of "Sensory and Motor Disorders of the Heart," by Blackhall-Morison, contains interesting and at times novel views.¹ It is essentially the work of an independent thinker and clinician with a penchant for anatomico-pathological investigations—a somewhat rare combination.

As a lifelong neurogenist he rejoices, even exults, in the fuller recognition of psychological and nervous influences

¹ "The Sensory and Motor Disorders of the Heart: Their Nature and Treatment," by Alexander Blackhall-Morison, M.D., F.R.C.P.; Second Edition, 1928. Baillière, Tindall and Cox. Demy 8vo., pp. 372, with illustrations. Price: 18s. net.

in the genesis of cardiac disorders contrasted with frank results of infections and degenerations. To date, the experimentalist and morbid anatomist are baffled by lack of evidence of lesions induced by a fatigue or anxiety neurosis or reflex causes, just as he may discover nothing to explain migraine or epilepsy.

However, nowadays the influence of nervous factors is becoming more widely admitted, especially in combination with a toxic element. The author likes to be dogmatic and states that the coronary vessels and the intracranials are richly endowed with nerves. This is contrary to current physiological teaching.

A very interesting case of coronary artery thrombosis is related in detail. Briefly, the patient, a man of seventy-six years of age, survived an attack of angina due to occlusion of the descending branch of the left coronary artery as proved at autopsy two years and seven months after the attack. In this period he had 431 aspirations for pleural effusions, without any other sign of dropsy.

The theories of causation of *angina pectoris* are discussed at length. The author inclines to the view that it is of neuro-vascular origin with at times an aneurysmal lesion of a coronary artery. Also he thinks it possible for a limited area of cardiac musculature to go into spasm or tetanic contraction inducing a sympathetic vagal reflex.

He rightly regards the arteries as more than "hæmducts," rather as muscular organs, "innervated, irrigated, mobile" and capable of being the seat of pain. *Angina pectoris* is usually either of primary vascular origin or secondary muscular type. An important clinical point noted by Heberden is the fact that respiration is never impeded by anginal pain and a full breath can always be taken, thus differing from the other forms of thoracic pain.

Another point made is that angina in a person over fifty proves the presence of arterio-sclerosis, even with a soft radial artery and absent signs of cardiac disease. Thrombosis of the right coronary artery is prone to cause a distribution of pain over the epigastrium.

Recognition of this may prevent a diagnosis of sub-diaphragmatic and gastric lesions and possibly dangerous surgery. Another clinical "tip" is the auscultation of the right jugular area for auricle sounds as in flutter.

Generally speaking the discussion on cardiac irregularities is not helpful. This book reflects personality, outspokenness, independent judgement and the ripe experience of a fine clinical observer. It can be cordially recommended to all those interested in that very important branch of our work embraced in the term cardiology.

PHYSIOLOGY OF THE THYROID AND ADRENALS.

In an ambitious volume of one hundred and fifty pages Dr. W. Cramer gives his views on fever, heat regulation, climate and the thyroid-adrenal apparatus.¹ The subject matter is largely based on the author's eighteen years' experimental work on the adrenal and the thyroid glands in which histo-chemical examination of the gland has been carried out after the intact animal (mouse or rat) has been subjected to experimental changes of temperature or has received injections of chemical substances or been otherwise treated to cause a change in heat production.

The author's views on the adrenal gland are convincing. He concludes that asphyxia, ether anaesthesia, injection of the drug β tetra-hydronaphthylamine and of certain bacterial vaccines and exposure to cold stimulate the gland to great activity, while oxygen deficiency and the injection of "Insulin" are not effective. The experimental results obtained are well demonstrated by the liberal use of excellent plates showing microphotographs of the adrenal glands.

His chapters on the thyroid gland will doubtless give rise to a lot of controversy, as many of his deductions are the antithesis of clinical facts. To give one example, Dr. Cramer claims to prove that hyperthyroidism *per se*

can give rise to fever, yet it is known beyond all doubt that the metabolism can be raised as much as 100% in hyperthyroid patients without any change in the body temperature. He considers that the thyroid stimulates the sympathetic nervous system and that "an intense stimulation of the sympathetic affects the physical heat regulation mainly in one direction, namely, that of diminished heat loss," yet one of the most constant and characteristic findings in hyperthyroid patients is the definite evidence of peripheral dilatation and increased sweating.

The author pays considerable attention to the glycogenic function of the liver in various thyroid states, but his experimental findings are too often the reverse of established facts to be lightly accepted.

When experimental findings and clinical observation are contrary to his thesis, the author explains away the difficulty by postulating "self-control," a hypothetical mechanism which is developed to a variable degree in different individuals to regulate the action of the various ductless glands; to one who had previously decried a heat regulation centre as "a crudely vitalistic conception," this, like some of *Punch's* cartoons, is among the "remarks that do not ring true."

The book ends with a stimulating chapter on "Climate and Civilisation," according to which the outlook for most of Australia is not very promising; he quotes Ellsworth Huntington as having proved that "changes of temperature, provided that they are not too great, are more stimulating than uniformity. In the temperate climate a fall is more stimulating than a rise and people are not so efficient on fine days with a clear sky as on cloudy days or after a storm."

This is an interesting and original book which should be read, but with a reliable text book of physiology at hand.

HÆMATOLOGY.

"DISEASES OF THE BLOOD," by A. Piney,¹ supplies the student with the outline of hæmatological work of immediate practical value, while theoretical considerations receive brief but judicious reference. It forms an excellent introduction to more detailed treatises on hæmatology.

The development and structure of the different blood corpuscles are dealt with before the general principles related to variations in their numbers are discussed. The leuchæmias (leucoses) and allied conditions, such as lympho-sarcoma and Hodgkin's disease, are next considered, while primary and secondary tumours of the bone marrow are briefly discussed.

A short survey of various anæmias, post-hæmorrhagic, hæmolytic, aplastic, osteosclerotic and chlorotic, precedes a longer discourse on pernicious anæmia. In the remaining chapters some anæmias of childhood, the hæmorrhagic diathesis (the purpuras, hæmophilia and scurvy), polycythæmia, certain splenomegalies and the morphological blood changes in different diseases receive due consideration. Three appendices on hæmatological technique, blood transfusion and the effects of X rays and radio-active substances on the formed elements of the blood contain valuable information. The glossary of hæmatological terms should save the student from the confusion which so often arises on account of the varied terminology used by different writers on this subject.

The pathological changes in the hæmatopoietic tissues rightly receive fairly full consideration since this knowledge is indispensable to the proper understanding of the various blood pictures.

Prognosis and treatment are dealt with in brief but useful fashion.

Though the book is designed to serve the student as an introduction to hæmatology, even the specialist will find within its pages much to interest and stimulate him. The volume can confidently be recommended to all interested in this important branch of medicine.

¹"Fever, Heat Regulation, Climate and the Thyroid-Adrenal Apparatus," by W. Cramer, Ph.D., D.Sc., M.R.C.S.; 1928. London: Longmans, Green and Company, Limited. Royal 8vo., pp. 163, with illustrations. Price: 15s. net.

¹"Diseases of the Blood," by A. Piney, M.D., M.R.C.P.; 1928. London: J. and A. Churchill. Royal 8vo., pp. 202, with illustrations. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, FEBRUARY 23, 1929.

The Aetiology of Malignant Disease.

THERE have been very many claims that the cause of cancer has been discovered. The earlier investigators incriminated a microorganism; Plimmer's bodies, Sjöbring's protozoon and a number of other alleged parasites were put forward as the causative organisms and at first attracted the serious attention of the scientific world. Fortunately the public was not misled; the daily press was less inclined to sensationalism in those days than it is today and those responsible for the publication of news were guided by cautious experts and were not prepared to sacrifice truth for increase in sales. Perhaps the workers themselves were less frequently seeking limelight. After a considerable number of bad guesses had been made, the parasitic theory of the causation of cancer dropped into disfavour and more attention was paid to possible chemical, physical and physiological processes. These hypotheses were unattractive to the lay public and premature announcements became less frequent. In recent times the work of Gye and Barnard has been given much prominence both in scientific circles and in popular publications. While their claims have been upheld by several competent investigators, their evidence has not satisfied the majority of those who have given the subject prolonged attention, and the verdict at the present time must be that of non-proven and probably not of general application. It is safe to state that the pathogenesis of malignant disease is still undiscovered and, further, that it is by no means certain that the cause is the same in the many forms of new growth. It is to be hoped that the remarkable article by Dr. T. Cherry that was published in this journal on February 9, 1929, will not be presented to the public as a solution of this important problem and that the world will possess its soul in patience while the author continues his researches, collects much more data and controls his preliminary results and while other investigators repeat Dr. Cherry's

experiments and record their results under varying conditions. That the work merits the most careful consideration cannot be gainsaid. It is of the utmost interest from many points of view. Even if his present conclusions eventually prove to be untenable, there is much valuable pathological and bacteriological information contained in the article that is worthy of permanent record. It is further eminently desirable that Dr. Cherry will not be hampered in the continuation of his investigations by lack of monetary support. Work of this nature is necessarily costly; many animals have to be employed; the observations have to be conducted over a long period of time and a great deal of expensive material is needed. We commend this research to some of the captains of industry in Australia as worthy of financial support.

Dr. Cherry started his work with some statistical observations that appeared to us, when they were published in 1924, to be remarkable and significant. His thesis then was that in those countries from which he had been able to gather sufficient information, the sum of the deaths from pulmonary tuberculosis and cancer remained practically constant. In many countries the death rate from tuberculosis has diminished materially during the last quarter of a century and concurrently the death rate from malignant disease has risen almost in proportion. It is true that the increase in the incidence and mortality from malignant disease is not so real as it appears. It has been shown that the proportion of persons surviving to middle age increases with the reduction of the deaths from pulmonary tuberculosis. Since malignant disease attacks people in middle and late life, this change would provide a relatively larger number of candidates for the former disease. Dr. Cherry has shown that in those countries in which tuberculosis has caused more deaths than formerly, cancer has caused less. This might be explained by the fact that the relative number of persons who reach the cancer age, has diminished. Dr. Cherry held, however, that there was a more subtle connexion between the two diseases. He therefore proceeded to do a thing that should not be done. He set himself the task of finding proof in support of a preconceived hypothesis. Had he based his experiments on the facts elucidated

in his statistical inquiry and contented himself with the problem that it was necessary to investigate every possible connexion between the incidence of tuberculosis and that of malignant disease, he would have freed himself from the possible charge that he started his experimental work prejudiced in favour of his hypothesis. As matters stand, he has placed himself in a somewhat false position. Experience teaches that an enthusiastic investigator usually finds little difficulty in adducing proof for the thesis he has constructed. In these circumstances Dr. Cherry's hypothesis that tubercle bacilli injected in small doses in animals resistant to these bacteria may give rise to tuberculomata, to neoplasms or to what he terms the lymphoid syndrome or to any combination of these three pathological conditions, will have to be proved by independent workers before the author can emancipate himself from the suspicion that the desire to obtain results has led to the realization of his hopes. It must nevertheless be recognized that he has given chapter and verse in support of his contentions and that the results of his inoculations are very remarkable.

An important and curious problem has been introduced in his work in connexion with the incidence of neoplasms and lymphoid reaction in the control mice. It is not our intention at the present time to discuss either the evidence or Dr. Cherry's explanation of the facts. For the present we wish merely to call attention to his findings. Since the incidence of both lesions in the mice nourished on raw milk is very high as compared with the incidence usually noted in these animals, it is reasonable to ignore these controls for the moment and to turn our attention to the control mice fed on boiled milk. The incidence of neoplasms among the inoculated mice fed on boiled milk was 62.2% as compared with 6% among the controls. But if mesoblastic tumours be excluded, the incidence of neoplasms was but six among forty-five mice inoculated. None of the control mice had any tumours other than mesoblastic. The actual number is small. More evidence is therefore required before it can be accepted that the inoculation of tubercle bacilli under conditions that militate against the development of manifest tuberculosis, gives rise to epithelial tumours in about 12%. Further, it will

be necessary before deductions can be drawn from these results to demonstrate that tubercle bacilli exert the same influence in animals other than mice, including man. It is by no means proven that carcinoma of mice and carcinoma of man are the same disease.

Current Comment.

IMMUNITY TO PNEUMOCOCCI.

DURING the last few years it has been demonstrated that the former teaching that certain bacteria, such as the streptococci, the pneumococci, *Bacillus typhosus* and the vibrio of cholera, do not produce exotoxins nor any true endotoxins capable of giving rise to antitoxins, is untenable. After antiserum had been produced against some of these and several other organisms, held to be incapable of producing exotoxins, attempts were made to ascertain the nature of the antigenic substances concerned in the various antibodies. The chemical nature of the antigen concerned in the reaction leading to the appearance of diphtheria or tetanus antitoxin has not been demonstrated. This subject need not detain us at the present time. It is usually supposed that the antibody in all the immunity reactions is either a part of the eu-globulin fraction or is loosely combined with this fraction. In the case of the antigens, however, it seems that there is a variety of substances concerned. Some very suggestive work has been conducted in recent times in connexion with the endotoxins, that is the component parts of the bacteria themselves. Nucleoproteins have been isolated from streptococci and from pneumococci. It has been found by Lancefield that the nucleoproteins are common to the majority of the streptococci and to all types of pneumococci. The antibodies to these substances have no special characteristics. The serum of persons infected with hæmolytic or green streptococci or with pneumococci is said to precipitate any member of this coccal group. These cocci also contain a carbohydrate, but each form has its own specific carbohydrate which does not yield antibodies active to the other members. In the third place there is a full protein or rather an antigen that cannot be demonstrated apart from the whole protein. This antigen is not only serologically specific, but the specificity extends to the types of streptococci and to the types of pneumococci. It has been suggested that the protein is responsible for the virulence of the cocci. Lancefield and Todd have recently carried out some highly interesting work in this direction. They have produced a considerable amount of evidence in support of the contention that there is a definite relationship between the type-specific protein constituent of hæmolytic streptococci and the virulence of the organisms. Further, it appears that strains of cocci deprived of this substance present avirulence and general signs of degradation.

W. S. Tillett has experimented with degraded forms of pneumococci in order to determine the character and degree of their antigenic power.¹ It had been found that the serum of rabbits immunized with the degraded, avirulent, non-type-specific pneumococci does not agglutinate Type III pneumococci nor does it precipitate the soluble specific substance derived from cultures of the same organism. It does not confer immunity on mice when injected into them. In the first place Tillett was able to protect rabbits against infection with Type I, Type II or Type III pneumococci by means of repeated intravenous, intraperitoneal or intradermal injections of living cocci. In the next place he injected the whole blood or the serum of highly immunized rabbits into normal rabbits and into mice. He discovered that passive protection could be conferred on normal rabbits, provided that from fifteen to twenty cubic centimetres of whole blood or not less than eight cubic centimetres of serum were injected. The protection manifested itself after one day. While the protection was induced in the majority of the animals, it was absent from a few. Attempts to confer passive protection against the avirulent form of pneumococci on mice failed. The amount of serum or blood injected was relatively larger in the case of the mice than in the rabbits. Tillett suggests that the immunity can be transferred to normal animals of the same species, but not to normal animals of another species. He reminds his readers of the fact that antipneumococcic serum contains type-specific antibodies which are active in all species. It is noteworthy that the protective substance acts equally against all three types of pneumococci. The immunity is developed gradually and it was found that eighteen injections spaced over six weeks were required before satisfactory protection or active immunity was established. Under the conditions of experiment a high degree of immunity was achieved.

In the present state of knowledge it would seem that the antigenic power in this form of non-type-specific immunity to pneumococci resides in the nucleo-protein constituent of the cocci. Since this substance is common to all the streptococci and pneumococci, the antibodies should be active not only to pneumococci, but also to haemolytic and green streptococci. No doubt this will be tested in the near future. There is evidence that in the course of the prolonged immunization a somewhat persistent bacteraemia is produced. As the immunity increases, the cocci in the blood gradually succumb. This suggests that the mechanism of the immunity is dependent on the appearance of bactericidal substances. It appears to us that this is of considerable importance. On the assumption that Tillett has definitely established his thesis that degraded, avirulent pneumococci can give rise to a complete protection against infection with any form of pneumococci, no matter which type is used for the immunizing, it would be evident that if

proof could be adduced that the antigenic substance is the coccal nucleoprotein, it should be possible to confer the same form of protection by utilizing the isolated nucleoprotein. At all events experiments should be carried out with this substance. Tillett has shown that even when living, non-virulent cocci are employed, many injections, spread over a considerable period of time, are required. In any experimental work this should be borne in mind and the immunization should be continued for a long time. There is already much indirect evidence to support the claim that Tillett's work should be carried much further. The experience of vaccine treatment of various pathological states has led many clinicians to believe that the protective mechanism is not to be sought in a specific organism, but rather in a non-specific protein. If this can be further narrowed to a non-specific nucleoprotein, it would be reasonable to expect that many of the doubts concerning the action of vaccines could be cleared up by following this line of research.

THE TREATMENT OF HAY FEVER.

In view of the large number of articles which have appeared in recent years in various journals on the treatment of hay fever, it is of interest to note a statistical report which has recently been published by M. A. Ramirez.¹ This author has used preseasonal treatment for 425 patients in private and hospital practice in New York. His figures relate to three classes of patients who have reacted to skin tests by various types of grass or ragweed. All those who gave no reaction, even when the pollen was applied to the nasal mucous membrane, have been ignored. It is these persons who present such a difficult problem both in regard to the aetiology of their condition and its treatment. The patients are further grouped according to the length of time between the commencement of treatment and the date of pollination. Ramirez has adopted the unusual method of summarizing the results of treatment according to the percentage of relief which each patient has received. He does not state whether this was determined subjectively or objectively, a matter of some importance in a condition like hay fever. The figures are thus subject to a large percentage of error. Space will not permit more than the statement that the best results were obtained in patients coming three months before pollination and receiving intensive treatment for two weeks with rapid increase in dosage, the injections being continued throughout the season. Autogenous vaccines and local treatment to the nose and eyes with increasing concentration of pollen solution were useful. It is noticeable that in nearly every group there is a number of patients who obtained no relief. This suggests that, even with those who improved, the pathogenesis is not fully understood.

¹ *The Journal of Experimental Medicine*, December 1, 1928.

¹ *The American Journal of the Medical Sciences*, December, 1928.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Relation of Intestinal Intoxication to Acne Vulgaris.

E. MARCOVICI (*Wiener Medizinische Wochenschrift*, October 20, 1928) refers to the close connexion between *acne vulgaris* and disturbances of the intestinal tract. In most instances hyperacidity, faecal stasis or spastic constipation and mucous or even ulcerative colitis can be observed. Mucous colitis was noted in all the author's patients and appeared to be the main predisposing factor in the skin condition. The papulo-pustular form of acne gave the impression of being a metastatic disease of the face and back secondary to the intestinal condition. Treatment depends on energetic intestinal disinfection. He advises colonic irrigation with ichthyol, two cubic centimetres (thirty minims) of a 20% solution combined with one cubic centimetre (fifteen minims) of tincture of belladonna in ten litres of water. Sulphur is administered by mouth and hypodermically, while injections of a suitable iron and arsenic compound are advisable. Ultra-violet rays have proved of the utmost value in the local treatment of the pustules combined with an ointment containing calomel and bismuth. The length of treatment varies from six to eight weeks. Vaccine treatment was also employed, but only as an adjuvant to thorough treatment of the intestinal tract.

Treatment of Baldness.

R. HABERMANN (*Deutsche Medizinische Wochenschrift*, September 14, 1928) discusses the causation and treatment of baldness. He considers that it is mainly due to a deficiency of cholesterol in the blood and refers to the increase in hair production during pregnancy when the cholesterol content of the blood is greatly increased. An alcoholic solution of cholesterol was used for experiments on animals as well as on patients, the controls used being vaseline, alcohol and simple friction with the finger. None of these had any effects on the animals as compared with the cholesterol preparation. Fifty patients with seborrhoeic alopecia were similarly treated with similar controls. In thirty-five instances the results after two months' treatment were remarkable—growth of hair, diminution of oily secretions and removal of scaly eruptions. In two of four cases of *alopecia areata* complete recovery occurred and in the others no further loss of hair took place.

The Gold Treatment of Psoriasis.

N. TOOMEY (*The British Journal of Dermatology and Syphilis*, November, 1928) has been using a preparation of metallic gold in the treatment of psoriasis for the last four years. The

process for making the gold suspension that the author recommends by bromination is gold tribromide 2.44 grammes or hydrobromic acid 2.50 grammes and bromine water to 100.00 cubic centimetres. The bromine is driven off by a slow fire for fifteen or twenty minutes. The effectiveness of the treatment is variable. The author claims that it is the most suitable medicament for initial internal therapy, but that it is not a sufficient remedy for all patients with psoriasis.

Lichen Planus of the Tonsils.

M. S. THOMSON (*The British Journal of Dermatology and Syphilis*, May, 1928) describes a case of *lichen planus* of the tonsil in a woman, aged thirty-three years, complicated by the presence of syphilis. Typical lesions later on appeared on the neck, scalp and left forearm. After treatment with *liquor hydrargyri perchloridi* internally and *lotio nigra* half strength as a gargle, the condition cleared up in the throat, but several months later the hypertrophic areas became softer and more red and a typical frambesiform syphilide developed on the sites of the old *lichen planus*.

The So-called Allergic Skin Diseases.

W. T. SACK (*The British Journal of Dermatology and Syphilis*, November, 1928) states that since 1921 he has investigated from the psychological standpoint all patients coming to him as a skin specialist. He was struck by the many connexions between skin affections and mental irritation. He draws attention to the part that itching plays in the development and cure of skin lesions and the bearing that emotional irritation has on eczema, urticaria, prurigo and neurodermatitis. The author has by hypnotism alone entirely cured many patients with pruritus. He states that much work has been done on other organs of the body from a psychological standpoint and that Bloch, of Zurich, published records of 170 patients with verruca treated by suggestion with 88% of cures in the case of *verruca plana*. He mentions the allergic reaction in the case of eczema, urticaria *et cetera* and the connexion between eczema and asthma and recalls the fact that a definite asthmatic attack with Charcot-Leyden crystals *et cetera* can be produced by a psychic shock. The writer holds that the allergy is merely one of the causes of this complex, but that there is a constitutional or acquired weakness of the autonomic nervous system. The correlation between the functions of the autonomic nervous system and the ductless glands suggested the use of "Ephetonin," a synthetic form of ephedrin which has the same pharmacological effect as adrenalin. Some striking results were obtained in some patients suffering from eczema with asthma and neurodermatitis. Psychotherapy is claimed to have a definite place in the treatment of skin diseases.

The Pityrosporon of Malassez.

J. M. H. MACLEOD AND G. B. DOWLING (*The British Journal of Dermatology and Syphilis*, April, 1928), in making various observations and experiments on the spore of Malassez, suggest that seborrhoeic dermatitis is a pure fungus infection caused by this yeast-like organism. The morphology can be studied in scrapings teased out in *liquor potassae* or in stained preparations. A useful method is to use undiluted Giemsa stain. The organism is pleomorphic, generally flask-shaped, from three to seven microns in length and as a rule arranged in groups or chains. In preparations from fluid media mycelial threads are found in abundance. It can be cultivated on Sabouraud's maltose agar and acid glycerine agar and occurs aerobically at 25° C. In galactose, maltose and glucose the media were rendered acid, in the two latter with slight gas formation. There was no change in the other sugars and litmus milk was unaffected. In order to try to establish a definite relationship between the organism and seborrhoeic lesions inoculations were made on the skin, both in patients suffering from seborrhoeic dermatitis and in persons unaffected. In all cases a seborrhoeic lesion could be produced if the organism were injected intradermally or implanted after scarification. No definite lesions were produced after rubbing a suspension of the fungus on the skin. In conclusion it is stated to be frequently associated with pruritus of the anal fold and of scrotal and inguino-crural dermatitis.

UROLOGY.

Treatment of Bladder Carcinoma.

E. L. KAYE (*Journal of the American Medical Association*, February 4, 1928) proposes to adopt a double standard in the classification of malignant disease of the bladder. In the first place tumours are cellularly malignant and consideration from this point of view determines what the tumour would do if it were not treated at all and in the second place they are clinically malignant; this point of view is concerned with the amenability of the tumour to treatment. The clinical malignancy of bladder tumours, speaking generally, has been rapidly diminishing during the last twenty years, but, although the clinical malignancy of the more superficial and localized malignant tumours has been controlled to an effective degree, that of the infiltrating growths remains, unfortunately, about the same. When innocent papillomata and papillary carcinomata are small and accessible by the cystoscope, they are easily destroyed by endoscopic fulguration, even if repeated treatments have to be made. But if the bladder has to be opened, prompt post-operative diagnosis by the cystoscope, followed by endoscopic treatment, if necessary, can be assured only by

closing up the bladder after the operation without suprapubic drainage. A second principle in the treatment is that the attack should be made confidently in the expectation of cure and the surgeon should depend on one therapeutic agent for the destruction of the tumour. He must decide what is the most powerful agent for the destruction of the particular tumour and use it; "shot-gun" therapeutics must be avoided. Radium implantation is the most hopeful of modern methods. The greatest objection to radium is the subsequent bladder spasm and pain owing to burning. This was a practical objection to the use of glass seeds; but metal seeds screen the β rays and transmit the γ rays. Seeds of 1.5 millicurie content do not burn the tissues perceptibly unless more than fifteen are implanted.

Studies in Ureteric and Vesical Pressure.

H. A. KREUTZMANN (*Journal of Urology*, April, 1928) has made manometric studies of the intraureteric and intravesical pressures in the non-anesthetized human subject. He concludes that there is very little increase in the bladder pressure from the point at which the feeling of the desire to void is experienced, to the point of maximum distension. There is very definite increase in the pressure when the act of micturition is attempted with the bladder completely filled. In the normal distended bladder no independent contractions of the bladder walls were noted. Intra-ureteric pressure is not equal on both sides at the same moment. The pressure in the ureters increases in direct proportion as the bladder is approached. As the bladder pressure increases by distension there is a direct proportional increase in the ureteric pressure. Intraabdominal pressure is an important factor in raising both the vesical and the ureteric pressures.

Thrombosis of the Renal Artery.

A. M. McKENNA (*Journal of Urology*, April, 1928) reports a case of thrombosis of the renal artery and reviews in detail thirteen which he has been able to collect in the literature. It appears that the lesion is most prevalent in relatively young persons and occurs more frequently in males. The principal aetiological factor is the presence of some form of heart disease. The chief symptoms are: (i) Sudden onset of violent pain in the renal region which may or may not be characterized by the usual anterior radiation. (ii) Urinary changes, chief of which is suppression or complete anuria. Albumin is usually present, but may be absent. There may or may not be red cells or casts. (iii) Vomiting, collapse, severe headache, slight leucocytosis and fever. The condition may be either unilateral or bilateral. In the thirteen cases reviewed eleven patients died and two recovered.

Benign Ureterospasm and Ureteric Stricture.

L. D. KEYSER (*Journal of Urology*, April, 1928) considers that the conditions of ureteric spasm, ureteric neurosis, nephralgia *et cetera* represent a neuromotor dysfunction such as is seen in the oesophagus and other plain muscle structures. The clinical method for distinguishing between inflammation and nodal spasm of the ureter are not clearly defined and often fail to reveal what mechanism is at fault in the particular case. It is not altogether of academic or theoretical importance to differentiate these conditions. The present methods of treatment are not satisfactory, especially as far as end results are concerned, and a better understanding of the pathology may lead to more rational therapy. Dilatation by repeated cystoscopy represents an ordeal to many patients, but as yet is the best method available. There is, however, need of further experience with regard to various sympathectomy operations.

Urinary Disturbances in Women.

F. T. LAU AND J. K. DE VRIES (*New York State Journal of Medicine*, May 15, 1928) have made a study of 700 female patients suffering from urological conditions; the study was prompted by the confusing relations existing between gynaecological and urological conditions. Putting aside the more definite surgical conditions of the urinary tract, it is ordinary bacterial infection and its effects which cause most difficulty in cure. For instance cystic degeneration or bullous oedema of the bladder neck may be the aftermath of a urinary infection and may need fulguration before any hope of cure may be entertained. Cystitis in the female is usually of bacterial origin. Its most common complication is urethral stricture which is most often situated near the external meatus. As regards the effect of gynaecological conditions, it is to be noted that any trauma such as occurs in childbirth and during gynaecological operations may cause cystitis, as may any extravascular pressure such as that caused by a displaced uterus or a pessary. Trauma in childbirth may cause frequency by injury to the vesical sphincter. Lesions in the female internal genital organs may even cause haematuria and frequency and be due to inflammation in the abdomen.

Perinephritic Abscess in Children.

H. A. REISMAN AND A. G. DE SANCTIS (*New York State Journal of Medicine*, May 15, 1928) declare that medical writers have neglected the subject of perinephritic abscess in children. Of a total of thirty-seven patients with this affection observed over seven years, seven were children. In many cases, however, the condition resolves and is put incorrectly on record as one of gastro-intestinal or other upset. It is only when pus is frankly formed and points posteriorly or is located by feeling a mass, that a perirenal abscess is suspected. Treatment is

obvious; the whole problem is purely diagnostic and early recognition is essential. Infection is usually of extrarenal origin. In the Mayo Clinic, during over ten years only forty-one instances of perirenal abscess occurred among 2,620 patients with primary inflammatory renal disease. The symptom of irritation of the psoas muscle is likely to occur only on the left side, as here the lateral aortic glands lie on this muscle, whilst on the right side they lie in front of the *vena cava*. The extrarenal origin of perirenal abscess is due to metastasis, usually from an insignificant infection. It is difficult to explain how the infected embolus passes into the renal artery through the kidney and thence into the perirenal fat. Many are of the opinion that the embolus becomes embedded in the cortex, forming a tiny cortical abscess which ruptures into the perirenal tissue. The extension however, may be through the communication between the subcapsular and the perirenal lymphatic plexuses.

Extraperitoneal Implantation of the Ureter into the Bladder.

J. E. BURNS (*Journal of Urology*, May, 1928) describes a simple method of reimplantation of the ureter into the bladder when the lower end of the ureter has to be removed for any reason. Two wedge-shaped pieces are excised from the lower end of the upper portion of the ureter; this leaves two flaps which are drawn into the bladder by forceps; the forceps are pushed through the bladder wall from inside into the cavity. In the female subject a hole should be made in the lower part of the broad ligament and the ureter drawn through it towards the bladder. The bladder itself should be drained suprapubically for some days in order to promote quicker union between the bladder and the ureter. Cigarette drains should be placed in the proximity of the space of Retzius and of the area of the new union for two days or so. By this open leakage of urine into the peritoneal cavity and its consequent dangers are avoided. Shock is greatly lessened and the physiological continuity of the urinary tract is very little disturbed.

Phleboliths as a Cause of Pelvic Pain.

J. N. DILLON AND B. A. CODY (*Journal of Urology*, May, 1928) declare that though phleboliths themselves may not cause symptoms, their presence indicates varicosities in the pelvic venous plexuses. It is reasonable to suppose that obscure lower abdomen and pelvic pain may sometimes be explained as pain caused by caries. The fact that in fifteen instances phleboliths were found to be located on the same side as the pain and that they constituted the only evidence of disease, convinced the authors that the phleboliths were probably responsible for the symptoms. The close proximity of the pelvic plexuses to the bladder and the ureters explains the frequency of bladder and kidney symptoms with normal urological findings.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Royal Alexandra Hospital for Children, Camperdown, on September 13, 1928. The meeting took the form of a series of demonstrations by the members of the honorary staff.

Cyst of the Bile Duct.

DR. R. B. WADE showed a female patient who had been admitted to hospital on March 7, 1928, complaining of pain in the abdomen, vomiting and anorexia. The pain had been so severe that it doubled her up. On examination there had been no tenderness in the abdomen and no rigidity. A rounded tumour behind the upper extremity of the right *rectus abdominis* muscle had been palpable. It had moved with the liver and had been continuous with the liver dulness. It had not extended beyond the middle line and had reached almost down to the umbilicus. The upper border of the liver had extended 2.5 centimetres (one inch) more than normal in an upward direction. No bile had been present in the urine. At operation on March 15, 1928, a cyst containing 450 cubic centimetres (three-quarters of a pint) of bile had been found connected with the common duct and another channel had been discovered running towards the duodenum. The cyst had been removed from its attachment and a tube had been inserted. Bile had been discharged immediately after the operation and the discharge had continued since.

An X ray examination had been made and no hydatid had been discovered. The fluid from the cyst had been examined by a pathologist who determined that it was bile. He had also described a cyst connected with the biliary system.

On July 31, 1928, the patient had been readmitted with pyrexia, abdominal pain and a discharge of pus from the fistula.

On August 3, 1928, tense tender swellings had appeared in the right thigh and the left arm. The child's condition had become worse rapidly. The pulse had been weak and the child cyanotic. On the following day three hundred cubic centimetres of citrated blood had been given from the mother. The condition had improved rapidly thereafter and the swellings had disappeared.

On August 26, 1928, the child had complained of pain in the arm and leg. Her appearance had been waxen. Morphine had been given for the pain. A second injection of citrated blood (three hundred cubic centimetres) had been given from the mother and immediate improvement had taken place. For two and a half weeks prior to this date the stools had been clay coloured, but since the administration of bile tablets the stools had been normal in colour. No organisms had been grown from the blood. Blood counts had been made on August 6, 15, 20, 21, 22 and September 7, 1928. On these occasions the erythrocytes had numbered respectively 2,180,000, 2,900,000, 2,380,000, 1,460,000, 2,170,000, 3,600,000 and the leucocytes 15,800, 8,000, 14,600, 14,300, 11,400, 10,000.

In discussing the child's condition Dr. Wade said that it was difficult to determine what should be done for the patient. He thought that at a later date it might be possible to anastomose the gall bladder to the stomach or to the duodenum.

Abscess of the Lung.

Dr. Wade also showed a female patient, aged ten years, who had been admitted on November 15, 1927. The tonsils and adenoids had been removed seven months before the patient's admission. A few days later she had begun to cough up blood-stained, offensive sputum. The condition had settled down for two months and then sudden pain had occurred under the right arm with cough and offensive sputum. On examination the percussion note had been impaired over the anterior aspect of the right apex. Scattered rhonchi had been audible all over the chest. The heart sounds had been clear. No reaction had attended the application of the von Pirquet test.

On November 24, 1927, an abscess had been opened in the apical region of the right lung and foul smelling pus had been evacuated. Prior to operation X ray examination had revealed the abscess in the lung and the radiologist had also reported that both antra and the left ethmoid were dull and that an increase in the area and density of mottling suggested the presence of pulmonary tuberculosis. A further X ray examination had been made on December 29, 1927, and no abnormality had been discovered in the urinary tract. On February 14, 1928, there had been a definite increase in both the density and the extent of the opacity in the right lung. Cultures had been made from the sputum and pneumococci and *Staphylococcus aureus* had been found. There had been no evidence of actinomycosis and no tubercle bacilli had been discovered. The patient had been sent to the convalescent home at Collaroy.

The patient had been readmitted on September 4, 1928. Her general condition had been excellent. The heart had been displaced to the right and it had been impossible to locate the left border. The percussion note had been on the right side both anteriorly and posteriorly. The breath sounds had been diminished below the clavicle on the right side and absent lower down anteriorly. On the posterior aspect they had been bronchial in character. Metallic crepitation had been audible both anteriorly and posteriorly at the right apex.

An X ray examination had been made on the following day and it had been reported that the opacity throughout the right side of the chest suggested fluid or pus, the shadow of which obscured any underlying lung condition. It was thought that some of the opacity might be due to lung consolidation. The heart shadow was completely to the right side.

Residual Paralysis.

Dr. Wade also showed a male patient, aged three years. Three months prior to admission the patient had become ill with a temperature of 39.4° C. (103° F.) and a "dropping of the head and back as if the spine was weak." He had been in bed until three weeks before admission and had been unable to walk. When he had begun to walk, he had fallen forwards; at the time of the meeting he did not do so, however. He could not rise into a sitting position without assistance. There was a history of scarlet fever six weeks prior to admission. The patient was a well nourished child. There was some wasting of the right *sacro-spinalis*. The abdomen was very protuberant and the muscles appeared paretic, but not definitely paralysed. Some scoliosis was present. The knee jerks were not elicited and the plantar reflexes were doubtful.

Embryonal Carcinoma of the Kidney.

DR. P. L. HIPSLEY showed a girl, aged three years, who had been admitted to hospital on August 9, 1928. The child's father had recently died of tuberculosis and according to the history she had always been delicate. On the day prior to admission she had fallen down two or three steps, had got up at once and cried, but had played about afterwards. Two or three hours later she had passed about one cupful of pure blood *per urethram*. Since that time every specimen had contained blood, but on the day of admission it had been more diluted. On examination the child's colour had been moderately good. Slight bruising had been present in the left loin and there had also been some resistance to palpation on the left side of the abdomen. An area of dullness had extended from the left hypochondrium down to the brim of the pelvis and forwards almost to the umbilicus. No abnormality had been discovered in the heart or lungs. No macroscopical evidence of blood had been discovered on examination of the urine, but a positive result had been obtained to the guaiacum test. The temperature had been 37.2° C. (99° F.) and the pulse rate 148 in the minute. On the night of admission the pulse rate had varied between 148 and 172.

On August 10, 1928, a well defined round tumour had been felt under anaesthesia in the left kidney region and a diagnosis of sarcoma of the kidney had been made. Four days later nephrectomy had been performed through the usual route. Recovery had been uneventful.

Osteomyelitis of the Pelvis.

Dr. F. C. ROGERS showed a male patient, aged seven years, who had been admitted to hospital on July 19, 1928, with a history of having been ill for two days, complaining of pain in the left groin, worse on movement. The patient had been feverish, delirious, had had no appetite and had not vomited. His bowels had been open on the day of admission. No urinary symptoms had been present and no cough. Sores had been present on the legs for several weeks.

On admission the child's temperature had been 40.5° C. (105° F.). Several patches of impetigo had been present on the right and left knees and ankles. No lymphangitis had been present, but tenderness had been noted in the groin. No glands had been palpable. Tenderness had been present in the left iliac fossa. The tongue had been furred. No abnormality had been discovered in the alimentary, respiratory or circulatory systems. The urine had contained a heavy cloud of albumin, but no blood. The leucocytes had numbered 13,200 per cubic millimetre. On July 20, 1928, the temperature had been 39.4° C. (103° F.). Vomiting had occurred, but the child's condition had been otherwise unchanged. Five cubic centimetres of a 1% solution of mercurochrome had been injected intravenously and a blood culture taken, as it was thought that possibly septicæmia was present. The culture had subsequently proved sterile. On July 23, 1928, rigors had occurred and tenderness had been very pronounced in the neighbourhood of the origin of the *adductor longus*. No swelling had been present in thigh or groin. X ray examination had failed to reveal a bony lesion. A few Gram-negative bacilli had been grown in culture of a catheter specimen of urine.

On July 25, 1928, an exploratory operation had been undertaken and tubes inserted into the infected bone. Streptococci in chains had been found on culture of the pus. On July 28, 1928, great tenderness had been manifest over the upper end of the tibia. At operation an incision had been made over the upper end of the tibia and the bone had been drilled; no pus had been found. The knee joint had been needled and pus obtained which was sterile on culture. On July 30, 1928, the temperature had been 38.9° C. (102° F.). The inguinal wound had discharged freely. The patient had complained of pain over the left angle of the mandible. No swelling had been present and X ray examination had revealed no abnormality. The tenderness over the mandible had subsequently disappeared. On August 5, 1928, tenderness and rigidity had been present on the right side of the abdomen and diminished breath sounds had been heard at the right base. Three days later pneumonia had been discovered at the right base. Recovery had gradually occurred and at the time of the meeting the inguinal wound was practically healed and the temperature had been normal for some weeks.

Dr. Rogers also showed a boy, aged two years and nine months, who had been admitted to hospital on May 23, 1928. The child had complained of being tired twenty-three days previously, but no pain had been present. Two days later it had been noticed that the child would not move his right leg and appeared to be tender over the posterior part of the right iliac crest. Tenderness had increased and during the four days prior to admission a tender swelling had appeared. The child had been very cross and ill and anorexia had been present. On the child's admission it had been noticed that he sat up in bed crying and that his temperature was 37.2° C. (99° F.). The right leg had been semiflexed and the child had cried when the leg was forcibly extended. Tenderness had been present over the posterior part of the right iliac crest with slight tenderness and oedema at the posterior extremity of the crest. Other systems had been clear.

At operation an incision five centimetres (two inches) long had been made over the oedematous area at the posterior part of the right iliac crest. The incision had been made down to the bone and pus had escaped. The track had been followed in an anterior direction for about 7.5 centimetres (three inches) with sinus forceps. The wound had been packed with compound tincture of benzoin and castor oil. The patient was put on a Hamilton

double abduction frame. Pus from the wound had yielded *Staphylococcus albus* on culture. On May 28, 1928, X ray examination had revealed osteomyelitis of the ilium and no sequestra had been seen. On June 15, 1928, numerous small sequestra had been seen and the patient had subsequently been discharged with a small sinus.

Erythredema.

Dr. E. H. M. STEPHEN showed a male baby, aged twelve months, which had been admitted to hospital on August 24, 1928. The patient was an only child, the father and mother were healthy and there was no history of tuberculosis in the family. The child had had no previous illnesses. Twelve weeks before admission a rash had been noticed on the abdomen and this had spread to the arms and hands. The hands and feet had always been cold. The child had sweated very freely and at times, the hands had become swollen. The child had been restless and irritable, had refused food and had been losing weight. On admission he had been under-developed. Irritability had been present with photophobia. Definite hypotonus with hyperextension had been present in all joints. The skin covering the hands and feet had been pink and over the entire surface of the body, excepting the face, hands and feet, there had been a small maculo-papular rash. The tongue had been clean, the tonsils injected. The abdomen had been soft and flabby, the liver margin 2.5 centimetres (one inch) below the costal margin and the spleen not palpable. The respiratory and cardiac systems had been clear. The urine had been clear, it had contained no pus cells and it had been sterile on culture. The leucocytes had numbered 33,000 per cubic millimetre.

Dr. Stephen explained that during the first two weeks after admission the temperature had frequently been raised to 38.3° C. (101° F.). The rash and pinkness of the feet and hands had become much improved and the child had put on nearly 0.45 kilogram (one pound) in weight.

Purpura.

Dr. Stephen also showed a child who was suffering from purpura. It is intended to publish the report of this case in full at a later date.

Henoch's Purpura.

Dr. M. J. PLOMLEY showed a male patient, aged six years, who was admitted to hospital on August 23, 1928. The child was suffering from Henoch's purpura. The family history was clear, the child had suffered from measles and was said to bruise easily. Three weeks before admission he had bitten his tongue and blood blisters had appeared. He had then passed blood in his urine and five days before admission had had an attack of acute abdominal pain with vomiting. The fæces had been blood stained. Examination on admission had revealed that the patient was a fine, well-developed boy. He had had a few bruises, one on the back and one on the chin. He had been bleeding from the tongue at the time of admission. After admission he had developed hæmatemesis and mælæna had persisted for a few days. A large hæmatoma of the lower lip had then developed. A blood count had revealed a secondary anæmia with a colour index over one and practically no platelets. He had been given fifteen cubic centimetres of whole blood intramuscularly and since then there had been no bleeding. Repeated blood counts revealed very few platelets and he was undergoing a course of non-specific protein therapy by intramuscular injections of milk.

Uræmia.

Dr. C. L. S. MACINTOSH showed a boy, aged twelve years. The family history contained nothing of importance. The child had suffered from pertussis, but had had no other illnesses. He had been admitted three weeks before the meeting with swelling of the face of twelve days' duration and occasional vomiting. He had been deaf and drowsy for three days. No other signs or symptoms had been noticed by the parents.

Examination on admission had revealed a dry and furred tongue. The alimentary and respiratory systems had been

clear. The cardiac apex beat had been in the fourth intercostal space within the nipple line. The second sound had been accentuated. No murmurs had been heard and the systolic blood pressure had been 135 millimetres of mercury. The patient had been quite unconscious. He had breathed heavily and had had no control over either urine or faeces. Very little urine had been passed. Convulsions had been frequent, occurring every two or three hours. They had varied in degree from twitching of the left hand and turning of the eyes to the left to general violent spasms in which the patient was with difficulty kept in bed. The pupils had been equal and had reacted to light and accommodation. The knee jerks had been present and the plantar reflex extensor in type. Lumbar puncture had been performed and fifty cubic centimetres of fluid under increased pressure had been removed. This had relieved the convulsions for about eight hours. For two days after admission the fits had been controlled by the administration of chloroform. Administration of fluid by mouth had been impossible because the patient had vomited everything. About twenty-four hours after admission venesection had been performed and two hundred and forty cubic centimetres (eight fluid ounces) of blood had been withdrawn. Three hundred and sixty cubic centimetres (twelve fluid ounces) of saline solution had been given intravenously. For the next three days subcutaneous injections of one hundred and eighty cubic centimetres (six fluid ounces) of saline solution had been given twice a day. The bowels had been moved every day, first of all with enemata and then with jalap and saline aperients.

The patient had recovered consciousness four days after admission and for the last twelve days had been improving steadily. His mental condition was becoming clearer. He was passing urine with a specific gravity of 1015. Baths of hot air had been given twice a day since admission, but without reaction.

The pathologist had reported that the urine contained albumin, blood, pus and granular casts. On admission the blood urea nitrogen had been 248 milligrammes, three days later it had been 135 milligrammes and seven days later 65 milligrammes. The cerebro-spinal fluid had been normal. At the time of the meeting the urine still contained blood and albumin.

Haemophilia.

Dr. Macintosh also showed a boy, aged nine years, who had been admitted to hospital twelve days before the meeting. There was no history of "bleeders" in the family. The history was that at intervals of two to three months the patient had had swellings and disability of various joints, particularly the right knee, hip and elbow. On examination the right knee joint had been uniformly swollen and periarticular swelling had been most pronounced. The joint capsule had been distended with fluid. The range of movement had been complete. No redness or heat had been present in the joint. No other joints were affected. The other systems had been clear.

Since admission a back splint had been applied to the right leg with firm pressure by wool and bandage over the knee joint. Daily injections of 6-6 mils (one hundred and ten minims) of calcium chloride had been given intramuscularly; three such injections had been given. These had caused extensive haemorrhage into the site of the injection and it had been necessary to discontinue them. At the time of the meeting the patient was receiving calcium chloride by the mouth and his condition was not improving. The coagulation time was thirty minutes and the number of platelets had increased. X ray examination revealed distension of the right knee joint and the presence of an incomplete old fracture of the right tibia and fibula.

Syphilitic Hemiplegia.

DR. LINDSAY DEY showed a girl, aged twelve months, who had been admitted to hospital on June 27, 1928. The family history was to the effect that the father and mother were healthy. There was one other child, aged three years and four months. The father "might have had syphilis." The mother had had no miscarriages. There

was nothing of importance in the child's previous history. Three days before admission the head had begun to droop towards the left arm. She had then lost the power of the left arm, the left leg and the side of the face. She had vomited several times. She had refused food. There had been neither convulsions nor delirium. The bowels had been well opened. On examination the child had appeared well nourished. The hands, especially the left, had felt cold. The child had been perfectly conscious. The fontanelle had been under normal pressure. Vision had been normal and the eye movements complete. The pupils had been equal and had reacted to light. Complete facial paresis had been present on the left side. The palate had lifted well and the tongue had moved in the middle line. The child had been able to move the left arm and leg slightly, but they had been definitely affected by paresis. The abdominal muscles had been held tightly. The left *pectoralis major* and the left *latissimus dorsi* had appeared to act. The child had been able to roll its head to either side and to sit up and hold its head up. It had kicked and moved the right leg and arm vigorously and normally. Muscular nutrition and tonus had been good, no definite rigidity had been present. It had been supposed that the child could probably feel pain quite well and no deep muscular tenderness had been elicited. The elbow, supinator, wrist, knee and ankle jerks had all been definitely exaggerated. The jaw jerks had been exaggerated and the organic reflexes had been normal. The other systems had been clear.

On the day after admission the child had had a spasm of two minutes' duration. There had been a general spasm of muscles with slight shaking movement. The child had been unconscious and the eyes had deviated first to the left and later to the right.

A blood count had been made on June 29, 1928, and the following findings had been recorded:

Erythrocytes, per cubic millimetre	3,700,000
Hæmoglobin value	50%
Colour index	0.67
Corpuscle index	74

The size of the erythrocytes had been normal and the shape regular, there had been no inclusions.

Leucocytes, per cubic millimetre	7,400
Polymorphonuclear cells	57%
Lymphocytes	40%
Monocytes	3%

No eosinophile cells and no abnormal leucocytes had been seen.

On July 3, 1928, the face had almost completely recovered, but the condition of the limbs had remained unchanged.

On July 6, 1928, a reaction had been obtained to the Wassermann test and a report had been received to the effect that the ocular fundi were normal.

On July 11, 1928, the arm had improved, the condition of the leg had been unchanged and the patient had been discharged.

Buphthalmos and Oxycephaly.

DR. E. C. TEMPLE SMITH showed a female patient who had been admitted to hospital at the age of five weeks. There was nothing of note in the family history and there were four other healthy children. The child had been breast fed. Examination at the time of admission had revealed a well nourished infant with the anterior fontanelle obliterated by deformity of the skull bones. Both eyes had been bulging and enlarged. The cornea had been slightly hazy, the pupils circular, the right being larger than the left. The tension in both eyes had been raised.

On the day of admission a trephining operation had been carried out on the right eye. Three days later the child had been discharged. On May 14, 1928, the child had been readmitted and a left corneo-scleral trephining operation performed.

On May 18, 1928, the serum had failed to react to the Wassermann test. A report had been received from the radiological department to the effect that the appearances suggested excessive head moulding. The patient had been

seen by Dr. Hipsley who had suggested that the head condition was oxycephaly. On May 21, 1928, the patient had been discharged.

On July 17, 1928, the patient had been readmitted and it had been noted that she had the steeple type of head and that the fontanelle was palpable. Both eyes had bulged, particularly the right. The tension in both eyes had been normal. Examination of the left fundus had revealed a blurred, yellowish, woolly disc, the sign of early optic atrophy. At this time the condition had been regarded as hopeless and blindness as highly probable.

In discussing the case, Dr. Temple Smith laid stress on the fact that when the child was first seen, the eyeballs were enlarged, the corneae were hazy and the tension in both eyes was raised. The skull had manifested premature synostosis of the coronal and sagittal sutures, but the orbital cavity had been present and moderately developed. The diagnosis had rested between buphthalmos (congenital glaucoma) and oxycephaly or possibly both, as each condition was due to a developmental error. In view of the unmistakable local signs and the presence of the orbital cavity each eye had been trephined. The tension (Schiotz) in each eye was normal, but it became raised when the child cried or struggled (under anaesthesia). The protrusion of the eyes was less. The question was whether in addition to the buphthalmos there was a slightly aberrant form of oxycephaly. This view might be supported by the fact that the left disc was "woolly" in outline and that its appearance was suspicious of papillitis.

Orbital Osteomyelitis.

Dr. Temple Smith also showed a boy, aged six years, who had been admitted to hospital on August 5, 1928. The family history had contained nothing of importance and, apart from an attack of food poisoning, the child had had no previous illnesses. The boy had been quite well up till two weeks before admission. He had then complained of left earache. Two days later he had vomited and had complained of pain in the stomach. He had been quite well on the following day, but had commenced to vomit again on the next day and had vomited about twice daily up to the date of admission. The vomiting had had no relation to meals. Four days before admission the left eye had "turned in." He had been drowsy occasionally, but restless at nights. Headaches had been frequent. He had been constipated. He had lost weight and had had no urinary symptoms.

Examination on admission had revealed a well-nourished boy, not complaining of pain or headaches. His tongue had been clean and moist and his fauces clear. The abdominal wall had been lax and he had appeared as if he had lost some weight. The spleen had not been palpable, the liver dullness had been normal and no abnormality had been found in other parts of the abdomen. The respiratory and cardiac systems had been normal. The pupils had been normal and had reacted to light and accommodation. Paralysis of the left external rectus muscle had been present. The knee jerks had been present and the plantar reflex flexor in type. There had been no Kernig's sign and no head retraction. Muscle tone had been poor. The *membrana tympani* had been normal on each side.

On August 9, 1928, lumbar puncture had yielded twenty cubic centimetres of clear fluid under increased pressure. On the following day the patient had been very drowsy, swelling had been present under the left eye and the optic discs had appeared normal. On August 11, 1928, ptosis of the right eyelid had been noted. An X ray examination had revealed dullness of the right antrum and the right ethmoid. The patient had complained of pain in the right eye on this day. The right frontal and ethmoidal sinuses had been explored and the fronto-nasal duct enlarged. The right antrum had been punctured and turbid fluid removed.

On August 13, 1928, proptosis of the right eye had been noted and orbital cellulitis had been present. As the maximum intensity of swelling and redness was over the outer right canthus and the eye was pushed inwards and forwards, it had seemed probable that periostitis of the

orbital roof was present. On the following day an exploratory incision had been made over the right canthus, but no pus had been obtained.

On August 17, 1928, considerable chemosis of the right eye had been present. Two days later signs of a corneal ulcer had made their appearance.

On August 27, 1928, another X ray examination had been made and the right antrum and right ethmoid had been very dull and evidence of early osteomyelitis had been found along the orbital border of the right frontal bone. No reaction had been obtained with the von Pirquet, Wassermann, diazo and Widal tests.

On September 1, 1928, the right eye had been enucleated and pus had discharged from the medial and lateral wounds. The temperature had been raised every day since August 9, 1928.

Post-encephalitic Syndrome.

Dr. A. W. CAMPBELL showed a male patient, aged one year and ten months, who had been admitted to hospital on August 17, 1928. The family history was clear and the personal history contained nothing of note. The child was a fairly precocious infant which had cut its teeth at six months and had sat up at eight months. He had not walked until eighteen months of age, but had commenced to talk at an early age. Three weeks before admission he had commenced to stagger and had become progressively worse. The arm movements had then become incoordinate and finally the child had been unable to walk. He was emotional and flew into violent tantrums.

At the time of admission there had been no paralysis and sensation had appeared normal. The reflexes had been normal and the cranial nerves intact. The child had not attempted to walk and had kept his legs stiff. He had been unable to sit up quite straight without support.

On August 23, 1928, the plantar reflex had been extensor in type and a jerky tremor of the body and a pseudonystagmus had appeared. No reaction had occurred to the Wassermann test and the fundi were normal.

Pseudo-hypertrophic Myopathy.

Dr. L. H. HUGHES and Dr. A. W. CAMPBELL showed a male patient, aged nine and a half years, who had been admitted to hospital on August 28, 1928. Inquiry into the family history revealed that the patient was the only living child in the family. One child had died at the age of six weeks of pneumonia and another had died at the age of four years of gastro-enteritis. The mother was an only child. The patient had suffered from pneumonia at the age of two and a half years, he had fractured his clavicle at three and a half years of age and had suffered from measles when he was five. He had not been really well since the attack of pneumonia. Weakness had increased in March, 1928. The legs had been getting weaker and he had seemed "to have no strength at all." Control of bladder and bowel was normal. He caught colds now and again. He had no chronic cough and had not vomited.

On examination it was seen that the child could sit up in bed and was quite cheerful. He had not been to school and could not read or write. The pupils were equal and reacted to light and accommodation. The knee jerks were absent and the plantar reflexes were flexor in type. The Achilles reflex was normal. The other reflexes were normal. There was general weakness and wasting of the muscles, except the calf muscles which were fairly well developed, but contracted. There was no rigidity or spasticity. The tongue was fairly clean and moist, the fauces were clear, but there were some carious teeth. The chest, abdomen and heart were clear. When an attempt was made to lift the patient with the hands under the armpits, he seemed to slip through the hands of the person lifting him. On walking he was unsteady with a base which was not particularly wide, and he walked on his toes. On attempting to rise from the supine position, he rolled over and climbed up his legs. No response had attended the application of the Wassermann test. No abnormality had been detected on X ray examination of the lumbar and sacral vertebrae. A faintly positive response had been obtained to the von Pirquet test.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Scott, Ronald Barrow, M.B., 1928 (Univ. Sydney), Stanhope Road, Killara.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Grieve, Edward James, M.B., B.S., 1927 (Univ. Melbourne), St. Vincent's Hospital, Melbourne.

Rowe, Cecil Hartley, L.R.C.P. et S. (Edinburgh), L.R.F.P.S. (Glasgow), 1928, Toorak.

Hardy, Charles William Kenneth, M.B., B.S., 1928 (Univ. Melbourne), Melbourne Hospital.

Kaines, Gwendolyn Elizabeth, M.B., B.S., 1928 (Univ. Melbourne), Kew.

Costigan, Francis Eugene, M.B., B.S., 1927 (Univ. Melbourne), Westgarth.

Prouse, Charles Henry, M.B., B.S., 1926 (Univ. Melbourne), Windsor.

Henderson, Austin Quirk, M.B., B.S., 1926 (Univ. Melbourne), East Malvern.

Eddie, Theodore Stirling, M.B., B.S., 1927 (Univ. Melbourne), Melbourne Hospital.

Evile, Violet Polyxena Austin, M.B., B.S., 1928 (Univ. Melbourne), Heidelberg.

Turner, John Burstall, M.B., B.S., 1928 (Univ. Melbourne), Hawthorn.

Stewart, Charles Edward, M.B., Ch.B., 1928 (Univ. Glasgow), Branksholme.

Dodd, Norman Laidman, M.B., B.S., 1927 (Univ. Melbourne), Melbourne Hospital.

Harrington, Norrie Nelson, M.B., B.S., 1927 (Univ. Melbourne), Northcote.

Mushin, Maccabee, M.B., B.S., 1927 (Univ. Melbourne), Alfred Hospital.

Godfrey, Graham George, M.B., B.S., 1928 (Univ. Melbourne), Brighton.

Bailey, Henry Kemple Bryon, M.B., B.S., 1928 (Univ. Melbourne), Homœopathic Hospital.

Cantor, Cecil Nathaniel Love, M.B., B.S., 1927 (Univ. Melbourne), Malvern.

Eddy, Eric Alfred, M.B., B.S., 1928 (Univ. Melbourne), Windsor.

Stewart, Charles Edward, M.B., Ch.B., 1928 (Univ. Glasgow), Cohuna.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the University of Adelaide on September 1, 1928.

Deep X Ray Therapy.

DR. H. A. MCCOY read a paper entitled "Some Aspects of Deep X Ray Therapy and Malignant Disease" (see page 238).

PROFESSOR T. BRAILSFORD ROBERTSON asked what was the reason for assuming an increase in metabolism from pituitary irradiation.

DR. MCCOY explained that he had used the word "metabolism" rather loosely and had meant merely that a pituitary effect had been the result.

DR. BRIAN SWIFT cited the effect of such irradiation on dysmenorrhœa *et cetera*. He also questioned the contra-indication of pelvic sepsis.

DR. MCCOY thought that the difficulty lay in what was considered to be the effect of stimulation by the rays.

DR. C. S. HICKS asked if the general location after irradiation indicated a local inflammation and, if so, whether this was the possible cause of the spread of infective processes.

DR. MCCOY thought that this would be a reason and further asked Dr. Swift to explain his contention that it was efficacious in pelvic cellulitis.

DR. HICKS inquired whether one of the chief difficulties was the maintenance of a constant discharge from the tube.

DR. MCCOY described the use of one way valves in the high potential circuit in combination with condensers for the purpose of maintaining a continuous potential.

Obituary.

NORMAN JOHN DUNLOP.

THE task of recording the events of the careers of those of the medical profession whose span is run, is never an easy one. It becomes immeasurably difficult when the colleague was held in universal esteem and affection and when the recital of cold facts has to be broken at every turn by an implied recognition of his warm humanity. To write calmly of Norman John Dunlop is an impossibility; to find satisfying words that may convey the truth, demands the pen of a sublime artist. It is a platitude to state that every one who knew him, respected, admired and loved him. But it is a truism to declare that the more intimate one's acquaintance with him was, the deeper grew that affection and the more profound was the enjoyment of his intellectual companionship.

Norman John Dunlop was born in Sydney in 1867. His father was an engineer of admitted ability. His great uncle was James Dunlop, Royal Astronomer, who came to Australia with Governor Brisbane, and who built the first observatory in the colony at Parramatta. He made his own optical instruments and it is certain that he did this well, for he gained international recognition, with tangible evidence of it in the form of gold medals from the astronomical societies of Denmark and France. Norman John Dunlop was educated at the Sydney Grammar School. He was a quiet, studious boy, fonder of books than of games and unwilling to push himself into the forefront. But he was a favourite among his comrades and a pet pupil of his masters. His courage, his good nature, his eminent fairness secured for him one of the first places in every community. At school he carried off more than his share of prizes. In 1887 he left school and entered the University of Sydney where he again distinguished himself as a student of unusual intellectual ability. He obtained a degree in Arts in 1890. In 1895 he passed the examination of bachelor of science and in 1896 he took his medical degree. Soon after graduation he obtained an honorary appointment on the surgical staff of the Coast Hospital, Little Bay. It is curious that notwithstanding his training in science and his predilection for abstract learning, he elected to become a surgeon. Early in 1897 he went to Stockton as *locum tenens* for the late Jeffreson Hester. After a fortnight he was appointed Medical Superintendent of the Newcastle Hospital, in those days a relatively small provincial institution. He had no thought of staying more than a year or two at Newcastle and in after life he referred to his protracted activities there as the result of chance. He held the resident position for three years during which time he recognized the need for a drastic reorganization of the institution and for a proper partition of the work. When Dunlop encountered a defect demanding reform, he determined to effect it and did not rest until he had achieved his end. In 1900 he was appointed an honorary medical officer of the hospital. There were

no physicians and surgeons attached to the hospital in those days. His senior colleague was Joseph Lieveley Beeston who had laboured long and strenuously for the welfare of the Newcastle Hospital. Both were strong men; both realized that if the growing needs of the community were to be met, much would have to be done within the hospital. Beeston knew that his junior colleague was a man of iron determination and that he was prepared for sacrifices and self-effacement in order to mould the future destinies of the hospital. The two men worked harmoniously together and their difficulties melted like snow.

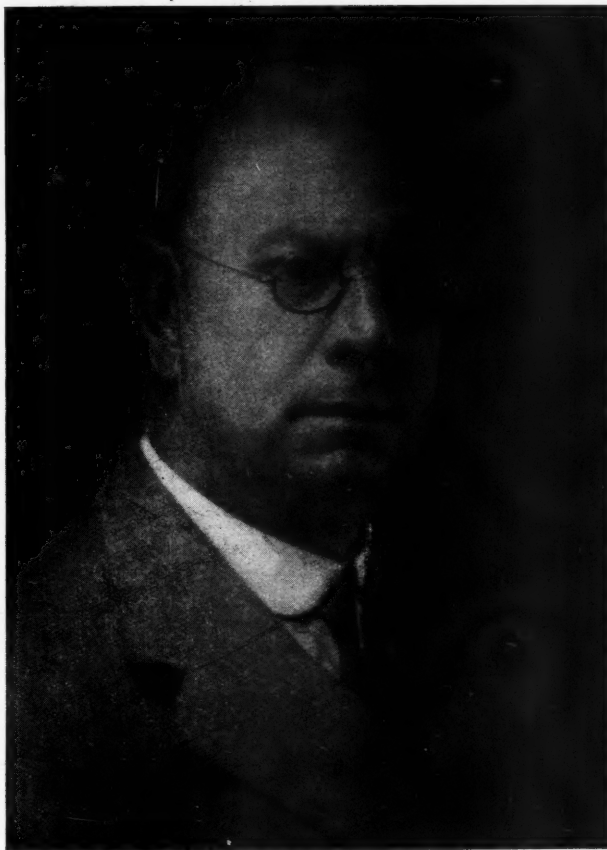
During his term of office as Medical Superintendent he became well known to the people as a practitioner of singular ability. His kindness was proverbial; he never spared himself when a patient needed his services and every one realized how valuable those services were. It was, therefore, not surprising that his private practice grew with extraordinary rapidity as soon as he left the institution. Although he did not neglect a single opportunity to perfect himself in the practice of surgery and to raise the level of surgical practice in Newcastle, he undertook general practice during the earlier years and his services as an obstetrician were requisitioned by an ever increasing number of women. In all he estimated that he attended about five thousand women in their confinements. He was very careful, bold when boldness was in place, always gentle, always firm. He combined with ripe experience and full knowledge of the science of obstetrics all those qualities of tenderness, humanity and patience that belong to an ideal general practitioner. He loved children and in consequence his advice was constantly being sought for little patients. For twenty-three years he worked day and night for his patients, never too tired to respond to a call, always prepared to apply the fruits of his learning, never concerned with the financial side of the transaction. He was a real altruist, for whom the aim and object of medical practice was to do good, to conquer disease, to cure, to allay pain and to maintain health. He was more than a medical practitioner, a surgeon to the majority of his patients. They not only loved him, but they trusted him implicitly and sought his help in all their worldly difficulties.

In 1916 he witnessed the realization of his endeavours in regard to the main organization of the Newcastle Hospital. When he first joined its staff it was practically a cottage hospital. Norman John Dunlop held that it was essential to enlarge the building, to divide the wards into medical and surgical and to make provision for the practice of the chief special branches of medical science. This reform led to his appointment as Honorary Surgeon. During the whole of his association with the hospital he paid especial attention to the nursing arrangements. He

lectured to the nurses and gave them other tuition. With the exception of the first three who received their certificates from the Australasian Trained Nurses' Association in virtue of their long experience, he assisted in the training of every nurse who served at the hospital up to the time of his retirement. The hospital became a recognized training school about the time of the reform in 1916 and Dunlop was one of the examiners.

Before the outbreak of war it was obvious to those who were at all intimate with him, that the state of his heart had prevented him from taking an active part in athletic sports. In 1914 his wish to serve his country was denied him for the same reason. Prior to this he had been in partnership with Dr. A. J. C. Crawley. The two men worked amicably together, although they were dissimilar in almost every respect. The practice had become much too large for one man to manage alone.

In 1921 Beeston died and Norman John Dunlop became senior Honorary Surgeon at the Newcastle Hospital. He worked for the St. John Ambulance Association both as lecturer and as examiner and for his valuable services he was elected an honorary life member. He was appointed medical officer to the Broken Hill Proprietary Steel Works at Newcastle from the time of its foundation. When the Central Northern Medical Association was formed he became a member, as did nearly all the members of the New South Wales Branch of the British Medical Association resident in the district. Later he was elected to the executive and for a year he filled the office of President. For several years he acted as delegate of this association at the annual meeting of delegates of the local associations with the Council of the New South Wales Branch. He was, however, not greatly interested in medical politics, although he was a staunch upholder of the honour and dignity of the medical profession. He was an honorary medical officer at the



Salvation Army Lying-in Hospital, and devoted a very great deal of time to the work in this institution. In 1923 the continued strain of his tremendous labours for his patients on his heart rendered it imperative for him to retire from active practice. In December of that year he left Newcastle to the intense regret and acute distress of a very large number of inhabitants. They made no secret of their feelings for their wonderful doctor who had worn himself out for their benefit. His partnerships had been terminated more than two years before. When he arrived in Sydney, he took up his residence near the Mitchell Library in order that he might indulge himself in the pursuit of literary research. He had contributed several medical articles to this and other journals, but had had neither the time nor the opportunity to study the early medical history of Australia. Complete

rest was out of the question for a man with so active a brain. He therefore started to work on his hobby, at first with diligence and long pauses and later with an ever increasing assiduity. He became a member of the Royal Australian Historical Society and later in recognition of his numerous researches, he was elected a Fellow. He wrote some highly interesting articles on the pioneers in medicine of Australia and on the men who rendered medical service from the days of Cook. He helped to found the Section of Medical Literature and History of the New South Wales Branch of the British Medical Association and was one of the original members. In this connexion he called attention to the neglect that Cook's surgeon William Broughton Monkhouse and surgeon's mate William Perry had suffered at the hands of Australian historians. The part that these men had played in the discovery and settlement of Australia is well described by him. He has suggested that it would be a suitable memorial to these two men if the Coast Hospital were re-named the Monkhouse and Perry Hospital, to perpetuate the names of the medical men who enabled Cook to bring the *Endeavour* with her human cargo safely into Botany Bay after having landed in Poverty Bay in New Zealand. Dunlop held that any hospital situated near the sea might be called The Coast Hospital. This one, placed close to Botany Bay, deserves a name fitted to its historical environment. On his retirement from the active staff of the Newcastle Hospital he was appointed honorary consulting surgeon, in recognition of his sterling services and his devotion to the institution. It would seem that those who were concerned with the appointment, entertained a silent hope that after a time Dunlop might return to Newcastle and render further help to the inmates of the hospital.

Norman John Dunlop was a skilled writer. His style was easy, lucid and rhythmical. He did not display his learning aggressively, nor did he select popular phrases or local idioms. His spoken word was also elegant and clear and reflected a highly educated and cultured mind. It will be gathered that he was an eminent surgeon, a fine practitioner, a most unselfish friend and acquaintance and a learned writer. This account would be incomplete were no reference made to his mate. He married somewhat late in life a lady with whom he lived in the most perfect harmony imaginable. His home life was ideal; he and she shared all that was worth sharing and each supplemented the other's intellectual being.

Dr. R. Scot Skirving writes:

In the dedication of his "Underwoods," Robert Louis Stevenson pays perhaps the best tribute in our language to the high qualities of a fine doctor. I shall not repeat

his words here, for they must be familiar, even to the most unread among us. All that is commendatory in them might well and truly be said of Norman Dunlop. Others doubtless will give a sketch of the facts of his useful and laborious life. I would rather say something of the man himself, for indeed he was no ordinary doctor and certainly not a very common type of man. Perhaps, indeed, he rather belonged to a past kind of practitioner, less rare fifty years ago than now. He was, first of all, a really sound well-knowledged all round medical man and especially a surgeon of wisdom, courage and competence. Besides this he loved learning for its own sake and delighted in good literature, having no small knowledge also of certain subjects quite apart from medicine or its associated sciences. All this he possessed and was, but he was much more, for he had character, character of the highest. Honour and right conduct were always

present in any dealing with which he was associated. Personality, too, which first attracted and soon provoked trust and affection. Surely the man whose qualities I have described, was no everyday man, but one who stood out as an honour to the profession he practised so well. It is indeed a matter of regret to some of us in Sydney that we only came to know Dunlop intimately during the years of his retirement, for, in truth, no one could know him without mental stimulation and perhaps a consciousness of one's own failure to reach his high level of heart and mind.

Newcastle had no small luck when Dunlop came there as a bird of passage and elected to make it the place of his life's work. But what of Dunlop? I had often wished his lines had been cast elsewhere. I don't say where, perhaps on the other side of the world, but at least in some place where he might have seen fewer cases, been paid more for those he did see and so had leisure and intellectual surroundings to make him produce an earlier and greater

literary output, technical or general, a thing not easy to do in the surroundings of that hard town in which he laboured, yet in which, notwithstanding, he never allowed the desperate rush of his daily work to hinder his acquisition of solid knowledge and the lighter side of literature. But things fell out otherwise and he remained the bondsman of the port of coal and strikes, where

"He led long days of labour
And nights devoid of ease"

for truly he "toiled terribly." A hunted, tearing life which went on for years and so in time the fate of so many good and busy doctors overtook him. He broke down, seriously. The warning was unmistakable and he accepted it. He had to slow down and finally give up. Then followed a

few years of desuetude and calm, but not the calm of rest and weariness. His mind happily possessed the elements of continued usefulness and occupation. He therefore did not peter out in useless reining and so go to seed in mental stagnation and boredom. He turned instead to intellectual pursuits and with natural aptitude and a well stored brain, he diligently busied himself with historical research, chiefly the medical history of Australia.

The Mitchell Library, that wonderful storehouse of all that is important and interesting in Australian history, proved a godsend to him. Happy days were spent in it and the result was seen in the articles written by Dunlop which are admirable examples of what such historical writing should be, correct in fact and written, as his were, in graceful, convincing language. Pages, indeed, which even those of us who as a rule read only plain roast and boil medicine find delightful and informing. It is perhaps to the Historical Society of New South Wales and to that Section of the British Medical Association which specially concerns itself with medical history that Dr. Dunlop's death means so much. Indeed, with regard to the latter, he was, from its inception, the man whom Dr. Cowlshaw could always rely upon to produce a paper of real merit.

His early wish had been to follow the sea. Circumstances prevented this, to the advantage of medicine, but his interest in sea affairs never flagged and for one who had never actually followed that profession, his knowledge of things pertaining to it was unusual and correct.

This fine man was curiously unwordly and unselfish. He was incapable of self-advertisement and knew nothing of the art of personal window dressing, but he was all the more lovable thereby. Of the happiness of his domestic life it is not perhaps permissible to speak, but he certainly found a true mate in the lady to whom I know we all feel just now a deep sympathy. One other quality I allow myself to mention. It was his keen sense of humour, for he saw fun in most things. I joy to think that even on the last distressful night of his life he was able to joke with the writer and tell him a witty and kindly story. His last illness was a trying one, a pitiful struggle for breath with all the ills brought by a failing heart. It is perhaps fairly easy to be brave in conditions of pain and misery when the time they endure is not long. Far otherwise it is to be gallant when weeks or months slip away in the unchanged confinement of a hopeless sick bed with half a dozen distressing disabilities to think of and tragic to endure. Yet Dunlop endured these discontents with a decorous fortitude, an *élan* and often a wit which days and nights of disquiet never altered. The profession is the poorer by his death and some of us have lost a dear friend and an example to lesser spirits how to do and how to bear.

ROBERT THOMSON PATON.

We regret to announce the death of Dr. Robert Thomson Paton which occurred at Sydney on February 17, 1929.

JAMES WILLIAM GARNETT POWELL.

We announce with regret the death of Dr. James William Garnett Powell which occurred at Manly, New South Wales, on February 15, 1929.

Correspondence.

NATIONAL INSURANCE NATIONALIZATION AND THE BRITISH MEDICAL ASSOCIATION.

SIR: Members of the British Medical Association in Australia should be under a debt of gratitude to Dr. Embleton for having so clearly pointed out various facts of a disturbing nature that tend to prevent the realization of the objects of our association.

One would like to emphasize, however, that the problems indicated apply to other States of the Commonwealth besides Victoria. This being so, many of the problems could be well handled by a "political" secretary and a small select committee as suggested by problems of the association in Australia. The secretary of such committee would need to be continuously engaged on this work and it should not be too much to expect the association in Australia to finance the secretariat. If we could be so fortunate as to obtain the services of a competent committee it should be possible to state this national problem as the association sees it. This having been done would it not be best to obtain the politicians' viewpoint by having our case discussed at a Premiers' conference?

It seems likely that many months will go by before the third reading of the National Service Bill comes before Parliament. There should, therefore, be time for the association to make a serious effort to face the problem along the lines suggested by Dr. Embleton.

If such attempt is made, we have a *prima facie* case for our earnestness and we might obtain assistance from the Federal Government in making some of the investigations that, as Dr. Embleton points out, are so necessary for the elucidation of the problem.

Yours, etc.,

E. S. MEYERS.

Wickham Terrace, Brisbane,
February 1, 1929.

A WARNING.

SIR: Referring to "A Warning" by Dr. Merrick O'Reilly in your issue of February 2, 1929, I would like to add that this "gentleman" Jas. Blair visited Healesville, Victoria, in February, 1928, complaining of colicky pain in his loin. I gave him the usual treatment for forty-eight hours and then got an excellent X ray of his renal tract which proved clear. I grew suspicious of his actions and a request for cash was sufficient to induce him to leave his kindly guest house keeper and myself both lamenting.

Yours, etc.,

HUGH G. MITCHELL,

Lister House,
61, Collins Street,
Melbourne,
February 1, 1929.

The College of Surgeons of Australasia.

We have just received a circular issued by the Council of the College of Surgeons of Australasia giving information in regard to the travelling arrangements for the annual meeting of the Fellows of the College and a daily time table of the meetings. It has been impossible without notice to reserve space to reproduce the details in this place.

The meeting will commence on March 5, when a meeting of the Council will be held in the B.M.A. Buildings, 30 to 34, Elizabeth Street, Sydney. On March 6 demonstrations will be held at the Medical School, University of Sydney, at the Lewisham Hospital and at the Royal Alexandra Hospital for Children. The annual meeting of the Fellows will be held at the Royal Alexandra Hospital for Children at 8 o'clock in the evening. The business will include the reception of the report of the Council and the financial statements, discussions on the building of a college at Canberra, on the question of fees, and on senior surgical qualifications and the submission of a motion in connexion with the expenses of State committees of the College of Surgeons.

On March 7 and 8 the Fellows will attend demonstrations and surgical operations at the Sydney Hospital, Saint Vincent's Hospital and the Royal Prince Alfred Hospital. In the evening of March 7 there will be special demonstrations by Professor Colin Mackenzie, by Dr. N. D. Royle,

by Dr. H. R. G. Poate and by Dr. S. Harry Harris. In the evening of March 8 Dr. Julian Smith will speak on the prevention and treatment of cancer and Dr. R. Graham Brown will give a demonstration in connexion with the diagnosis and treatment of cancer of the larynx. A presentation of his portrait will be made to Mr. Hamilton Russell. The evening meetings will be part of the annual meeting proper and will be held at the Royal Alexandra Hospital for Children.

A CORRECTION.

IN our issue of January 19, 1929, it was stated editorially that few communications on ophthalmic subjects had been made to this journal and that few papers on diseases of the eye had been read before meetings of the Branches of the British Medical Association in Australia. It was also stated that there was no ophthalmic section of a Branch. This is incorrect. For many years there has been an Eye and Ear Section of the Victorian Branch. Last year it was decided to divide this section into two parts. There is now an Ophthalmological Section and a Section for the Ear, Nose and Throat. We regret that the wrong information was published. We are informed that the two sections have as their members nearly all the Melbourne ophthalmologists and ear, nose and throat specialists as well as some from the provincial cities.

LISTS OF MEMBERS.

It has been decided to issue the lists of members of the several branches of the British Medical Association in Australia as a document apart from this journal. As the cost of setting and printing this list is considerable, the Directors of the Australasian Medical Publishing Company, Limited, have resolved to offer the copies for sale at one shilling each. Members desiring to receive a copy should send in their orders either to the Honorary Secretary of the Branch to which they belong or to the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales, together with a postal note for one shilling. The orders must be received not later than February 28, 1929.

Diary for the Month.

- FEB. 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 FEB. 26.—Section of Orthopaedic Surgery, New South Wales Branch, B.M.A.
 FEB. 27.—Victorian Branch, B.M.A.: Council.
 FEB. 28.—South Australian Branch, B.M.A.: Branch.

Medical Appointments.

Dr. Ronald C. C. Sword (B.M.A.) has been appointed Medical Officer at the Port Douglas District Hospital, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

- AUSTRALIAN INLAND MISSION: Flying Doctor.
 CHILDREN'S HOSPITAL, CARLTON, VICTORIA: Honorary Vacancies.
 DEPARTMENT OF INSPECTOR-GENERAL OF HOSPITALS: Junior Medical Graduates (four).
 RENWICK HOSPITAL FOR INFANTS, SUMMER HILL, NEW SOUTH WALES: Resident Medical Officer.
 THE ADELAIDE CHILDREN'S HOSPITAL, INCORPORATED: Honorary Anaesthetist.
 THE BENEVOLENT SOCIETY OF NEW SOUTH WALES: Honorary Vacancies.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.